



Municipality of Singapore

HEALTH DEPARTMENT

ANNUAL REPORT

for

1936

Printed by
LITHOGRAPHERS LIMITED,
SINGAPORE.
1937.

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HEALTH DEPARTMENT.

SINGAPORE, 1st March 1937.

THE PRESIDENT,

MUNICIPAL COMMISSIONERS,

SINGAPORE.

SIR,

I have the honour to submit my report for 1936.

I. ZYMOTIC DISEASE.

2,793 cases were notified compared with 2,301 in 1935 and 1,770 in 1934.

The following table shows the comparison between the year under review and the previous ten years:—

Year	Typhoid Fever	Diphtheria	Chicken-pox	Puerperal Fever	Erysipelas	Cerebro Spinal Fever	Paratyphoid Fever	Small-pox	Plague	Cholera	Typhus Fever	Scarlet Fever	Tuberculosis	TOTAL
1926 ..	197	46	169	25	14	6	1	34	7	22	1	1	642	1,165
1927 ..	235	29	193	22	5	17	7	19	4	30	—	—	733	1,294
1928 ..	230	59	350	11	8	15	12	9	5	9	1	3	808	1,520
1929 ..	133	57	577	13	8	3	—	9	3	—	—	6	904	1,713
1930 ..	156	63	349	11	9	22	2	—	—	—	—	2	965	1,579
1931 ..	150	65	211	28	6	8	1	3	—	—	—	—	944	1,416
1932 ..	114	124	542	16	2	6	1	8	—	—	—	1	846	1,660
1933 ..	248	244	283	11	5	4	7	1	1	—	1	—	970	1,780
1934 ..	116	254	412	6	5	7	4	1	—	—	3	2	960	1,770
1935 ..	415	193	529	16	5	11	9	52	—	—	18	—	1053	2,301
Average for 10 years ..	199.4	113.4	362.0	15.9	6.7	9.9	4.4	13.6	2.0	6.1	2.4	1.5	882.5	1619.8
1936 ..	455	176	833	22	9	16	6	1	—	—	15	—	1246	2,779

The following table shows the incidence by nationalities:—

DISEASE	Europeans	Eurasians	Chinese	Malays	Indians	Others	TOTAL
Enteric Fever ..	1	14	374	33	25	8	455
Diphtheria ..	8	8	151	2	4	3	176
Chicken-pox ..	10	74	149	52	541	7	833
Puerperal Fever ..	—	1	10	7	4	—	22
Erysipelas ..	—	2	5	1	—	1	9
Cerebro-spinal Fever	—	—	12	—	4	—	16
Paratyphoid Fever	—	—	4	1	1	—	6
Small-pox ..	—	—	—	—	1	—	1
Plague ..	—	—	—	—	—	—	—
Typhus Fever ..	3	—	5	—	7	—	15
Scarlet Fever ..	—	—	—	—	—	—	—
Tuberculosis ..	1	19	1,007	71	134	14	1,246
Total ..	23	118	1,717	167	721	33	2,779

The following return shows the number notified for each month of the year:—

DISEASE	January	February	March	April	May	June	July	August	September	October	November	December
Enteric Fever ..	49	46	59	28	52	65	41	27	24	21	21	22
Diphtheria ..	12	17	13	16	8	18	10	15	12	15	18	22
Chicken-pox ..	80	102	101	96	74	43	50	48	68	53	71	47
Puerperal Fever	1	—	2	1	—	2	4	2	3	1	2	4
Erysipelas ..	2	—	1	1	—	—	1	—	1	—	1	2
C.-Spinal Fever ..	—	3	1	2	1	2	2	—	1	3	—	1
Paratyphoid Fever	1	2	1	—	—	—	1	—	1	—	—	—
Small-pox ..	—	—	—	—	—	1	—	—	—	—	—	—
Plague ..	—	—	—	—	—	—	—	—	—	—	—	—
Cholera ..	—	—	—	—	—	—	—	—	—	—	—	—
Typhus Fever ..	2	—	2	1	1	—	3	2	3	—	—	1
Scarlet Fever ..	—	—	—	—	—	—	—	—	—	—	—	—
Tuberculosis ..	88	96	97	113	103	102	102	110	117	125	94	99
Total ..	235	266	277	258	239	233	214	204	230	218	207	198

The year was practically completely free from Cholera, Smallpox and Plague. There was one case of Smallpox only, and that imported. The patient, an adult Indian male, reported sick on 22nd June. It transpired that he had been released the previous day from St. John's Island, where he had just completed a period of quarantine following on his arrival from India in a Smallpox infected ship. I am assured that 14 days had elapsed between the discovery and isolation of a case on the ship and his release from quarantine from St. John's. It is admittedly not easy to ensure complete isolation, and especially disinfection of all infected material, on board ship so that the advisability of holding all contacts arriving at each port in the Peninsula for the full fourteen days after landing is well worth considering. This especially applies to contacts with successful vaccinations, as was the case in the present instance.

The patient was immediately transferred to St. John's Island along with 68 contacts from two houses in Trafalgar Street.

The usual routine rat-trapping laid down by the International sanitary convention was carried on throughout the year. Rats caught both in the Port area and in the town were brought to the laboratory for examination. None were plague infected. Full details will be found in the Bacteriologist's report.

TYPHOID AND PARATYPHOID FEVERS.

461 (6 Paratyphoid) cases were notified against 424 in 1935 but as there were 157 deaths recorded as due to this disease it is likely that many attacks were not reported in any way.

Though the incidence was rather higher in the first half of the year, our experience, generally, was the same as in other years. Cases were more or less evenly spaced over the months, and scattered indiscriminately all over the town, and at no time was there a suggestion of even a localised outbreak which might be attributed to any single source.

School children again figured prominently, 82 being attacked.

As much time as could be spared by a rather overworked Staff was given to detailed investigation of cases, but no fresh evidence was forthcoming to cause me to alter the opinion expressed in many previous reports i.e. that most of our cases are caused through the agency of "carriers" engaged in the preparation and distribution of cooked food and drink to the general public.

It is true that more arbitrary powers for dealing summarily with the peripatetic food hawker have recently been granted, but the full application of these has been held up pending the passing of new Food and Drugs regulations. Meantime, much work is being done in collecting information with regard to the multifarious foods and drinks that are sold on our streets. This evidence is being obtained to give us some indication of the probable best line of attack, as it is out of the question

to try to frame regulations for every type of hawker. There is already strong presumptive evidence that the hawking of ice cream and iced drinks may be responsible for many of the cases.

DIPHTHERIA.

176 cases were notified against 193 in 1935.

There is little improvement in the attitude of the public generally toward this disease, and there is still the regrettable tendency on the part of parents especially to take the affection lightly. This is well shown in the report on the working of the Middleton Hospital. Many of the 146 cases received for treatment were admitted in a moribund condition. 21, in fact, died within 24 hours of admission, and 27 required tracheotomy. Dr. Gilmour in his report makes certain suggestions as to the possibility of immunising young children in the Infant Welfare Clinics, that are well worth serious consideration.

None of the other infectious diseases call for special comment.

GENERAL.

1. Medical Inspection of Passengers.

2 permits to land embracing 2 persons were granted. Both failed to report.

2. Disinfection of infected articles.

579 articles were disinfected—the steam disinfector being used on 5 occasions.

3. Houses quarantined and disinfected.

2 houses were quarantined and 1,036 (478 Phthisis) were disinfected.

4. Infectious persons and contacts.

675 patients were removed to Middleton Hospital. 64 bodies were buried under supervision. 68 contacts were sent to St. John's Quarantine Station.

II. MIDDLETON HOSPITAL.

At the end of 1935 there were 16 patients remaining in hospital while during the year under review there were 1,670 admissions making a total treated of 1,686. Of these, 1,572 were discharged, 78 died, while 36 remained in hospital at the end of the year.

Of the total, 42 deaths were due to Diphtheria, 21 of these occurring within 24 hours of admission.

The full report of the Medical Superintendent, Dr. Gilmour, is appended.

III. VACCINATION.

The following vaccinations were reported:—

	Successful	Modified	Failed	Not Seen	Total
Municipal Vaccinators ..	13,408	7	15	314	13,744
Private Vaccinators ..	467	—	—	—	467
Medical Practitioners ..	2,096	—	4	—	2,100
Total	15,971	7	19	314	16,311

The nationalities of those vaccinated by Municipal Vaccinators were Europeans 10, Eurasians 106, Chinese 11,390, Malays 1415, Indians 712, and others 111. Of these 7,079 were males and 6,665 females of the following ages:—

Under 1 year	..	..	..	12,467
1 to 2 years	..	..	..	618
3 to 5 years	..	..	..	73
6 to 10 years	..	..	..	162
11 to 20 years	..	..	..	147
Over 20 years	..	..	..	277
Total	..	..	..	13,744

10,940 vaccinations were performed at the depots, 2,331 at Police Stations, 394 in the Child Welfare Clinics and 79 in private houses.

IV. VITAL STATISTICS.

A Census of the Municipal Area was carried out on the night of June 30th. The results are set out in the following table:—

	MALES	FEMALES	TOTAL
Europeans ..	5,460	2,878	8,338
Eurasians ..	3,491	3,660	7,151
Chinese ..	220,331	153,786	374,117
Malays ..	24,387	20,690	45,077
Indians ..	38,104	9,298	47,402
Others ..	4,528	3,542	8,070
Total ..	296,301	193,854	490,155

After the speculations in which I have had to indulge for the past four years since the last Census in 1931, it is a very real pleasure to work with actual figures. Before discussing these, however, and the conclusions to be drawn therefrom, I wish to offer to Mr. Vlieland, the officer who conducted the 1931 Malayan Census, a very complete apology. In his admirable report on that Census he put forward for consideration and possible adoption several suggestions and formulae for the better estimation of the population in intercensal years. Because they appeared to me to be too speculative, and somewhat revolutionary, I had

not the courage to employ them. My estimates for the years following the Census were arrived at by simply adding the excess of births and deaths at the end of the year to the mean annual population of the year in question. This method entirely failed to allow for the fact that there was a continuous exodus of Chinese and Indians, and especially males of these races, going on until well into 1933, with the result that my estimates of these races were much in excess, and their sex ratios greatly at variance with the facts. I am now quite convinced that, had I employed Mr. Vlieland's methods, I should have given estimates that must have been approximately very close to the truth.

Mr. Vlieland's system of estimation is based on two main working hypotheses.

- (a) That the number of births per thousand for each year within any one intercensal period varies only with the age distribution of the female population, and that this variation is relatively small and evenly progressive.
- (b) That the relative deadliness of a given year, as compared with the last census year, is the same for both sexes.

His procedure in estimating the mean population of a given year is, first to obtain the female population by multiplying the number of births registered in that year by a certain factor X; then to calculate the female death rate in the orthodox way; then to obtain the male death rate by another factor Y; finally to calculate the male population from the male death rate and the number of male deaths registered. His factor X is obtained from the known values of previous census years by assuming continuance of the same trend of change. His factor Y has hitherto, owing to inadequacy of data, been assumed constant at the figure known for the last census year. Results indicate that the error imported by this assumption is small but he informs me that he hopes in future to introduce an allowance for variations from year to year.

In 1931 we were both agreed that the usual methods of estimating intercensal population in vogue in more settled countries were literally useless in Singapore, where both the absolute numbers, and the sex ratios, of Chinese and Indians especially, are subject to wide variations in quite short periods of time. To overcome this difficulty, Mr. Vlieland elaborated the methods briefly described above.

I myself have for many years been convinced that the maternity rate for Asiatic women is more or less saturated, and I have long felt that it should be possible by taking advantage of this fact, and using the number of births of any Asiatic race in any one year, to give a reasonably close approximation to the number of women of that race present in the population during the year. That the assumption of saturation is more or less correct will be seen in the following table, which shows the rates for women of the Chinese, Malay and Indian races, in three census years. I omit the 1921 census year as Registration of Births was admittedly not so thorough as it has been in the later years.

	Chinese			Malays			Indians		
	Women	Births	Rate	Women	Births	Rate	Women	Births	Rate
1926 ..	100,597	10,386	103	15,470	1,386	89	4,988	654	131
1931 ..	125,996	13,229	105	19,892	1,758	88	6,485	917	141
1936 ..	153,786	17,093	111	20,690	1,842	89	9,298	1,314	141

Briefly the rate represents the number of women per 1,000 women of all ages of those races who bore a child during the year. It will be noted that the Malay rate is practically a constant. I do not think that estimates of women based on the last census rate, or an average of the three census rates, could be very far out.

Why, in the past four years, I have neglected to make use of this index I do not quite know as my belief in it has been fixed for some time. My only excuse is that it is somewhat revolutionary.

Mr. Vlieland makes use of this same assumption in his formula. But his is much more elaborate than my simple method, and takes into account the proportion of women of child bearing age to the total female population. Again, from examination of the figures for census years, I have found this proportion to vary but little and at first sight I was of opinion that it might be ignored. Mr. Vlieland, however, points out that owing to the proportionately increased number of births, following on the changing sex ratios, the number of younger people in the population is proportionately increasing, with a corresponding alteration in the age distribution of women, so that I agree he is correct in recognising this trend and allowing for it.

It will be remembered that in my 1931 report I expressed the opinion that the Census of that year had failed to enumerate many children, especially infants. After certain check censuses had been carried out, I came to the conclusion that upwards of 19,000 children up to the age of 5 had been so missed. That figure I added to the permanent population in 1932. I am still of opinion that many infants were missed, as even in the 1936 Census, despite special attention paid to the enumeration of children and their ages, it is obvious that many infants have still been missed. But, with that reservation, I am now quite satisfied that Mr. Vlieland was correct in saying that many children were lost by emigration, and the 19,000 which I added was very greatly in excess of what was justified.

Again in 1932 and 1933, from various evidence I argued that the population was more or less stable, and that the drift outward, due to the slump, had ceased. On the contrary Mr. Vlieland, from his knowledge of Malayan Statistics as a whole, but chiefly from the figures derived from his formulae, held that the exodus was operative right into late 1933, and therefore my intercensal populations were greatly over estimated and the published death rates, in consequence, unduly flattering. I now agree his figures prove he was correct. Moreover, his figures also bring out what mine entirely failed to do, namely the great change in the sex ratios of Chinese and Indians brought about by the disproportionate exodus of males. That this change in the sex ratios had taken place was finally proved in the 1936 Census but to my mind Mr. Vileland's estimates from year to year were alone sufficient to prove the truth of his theories.

At no time did I ever attempt to devise methods for estimating the male population, but Mr. Vlieland in his anxiety to obtain better estimates went much further than I was prepared to follow him. In estimating males he makes use of the comparative death rates for males and females in a census year and assumes the same relative deadliness for the ensuing intercensal years. I find, however, on examining these rates for several

census years that there is not the same relative deadliness in all census years. The rates are interesting enough for them to be recorded, which I do in the following table:—

ALL RACES.

		Male Death Rate per 1000	Female Death Rate per 1000	Index
1921	..	36.45	28.86	1.2629
1926	..	37.32	30.30	1.2316
1931	..	25.18	25.24	.9976
1936	..	24.38	24.00	1.0158

It is obvious that any attempt to make use of the comparative death rates of males and females in 1926 to enable one to estimate the male population for the intercensal period following, must have landed in disaster. This great apparent improvement in the male death rate as against the female death rate rather perplexed me at first, but I am now confident it can be explained, in great part at least, by the fact that in previous years and especially in good times many "external" male deaths, not represented by corresponding live males in the population, were "debited" unfairly to Singapore town. By 1931 when industry was coming to a standstill and labour forces outside everywhere at a minimum, we did not suffer from this to anything like the same extent. Corroboration of this may be found in the comparative male and female death rates in Malays. The index figure of 1.054 in 1926 had only improved to 1.020 in 1931. It is well known that Malays, when ill, find what relief they can at home and do not show the same tendency to come into the big hospitals in Singapore and other towns. For this reason it is my opinion that the 1931 comparison of male and female death rates is the truest we have ever had or are likely to have—at any rate while the facilities for tracing patients and referring deaths to their proper place of origin remain so inadequate as they are at present.

In 1936 the relationship of the rates had altered but little and if one had used the 1931 index, as did Mr. Vlieland, to estimate males in the following intercensal year one could not have been far off the truth. Nor does there appear to me to be much risk in using the present 1936 index for the next four years, though for this reason given above, it might give even greater accuracy if the 1931 index were used permanently to find Mr. Vlieland's factor Y.

Yearly, since 1931, Mr. Vlieland, immediately on being supplied with the births and deaths for the past year, has sent us his estimates for the mean annual population. In fairness to him, and with his full permission, I now publish the figures which he submitted. It should be noted that he does not use the actual 1931 Census figure. His reason for this was because it was fairly obvious that the exodus, which caused the temporary fall in the population of Singapore, began some time before the 1931 Census which was held on April 1st. This exodus explains why the estimated mean population of 1930 is so far above the 1931 figure and why the latter is below the 1931 Census figure. It will be noted too that he has given his estimates for 1936, the Census year. These last were obtained from his formulae, which he supplied beforehand, and the number of births and deaths for the year immediately these were known.

For comparison I also give the official figures published in my annual reports for these years.

MR. VLIELAND'S FIGURES

Year	Mean Population	Births		Infant Deaths		Death at all ages		
		No.	Rate	No.	Rate	No.	Rate	
1930	..	509,970	17,702	34.71	3,877	219	13,748	26.96
1931	..	439,540	16,488	37.51	3,369	204	11,233	25.55
1932	..	421,230	16,589	39.38	2,994	181	9,480	22.51
1933	..	418,170	16,881	40.37	2,980	177	9,387	22.45
1934	..	429,670	17,329	40.33	3,107	179	10,162	23.65
1935	..	470,900	19,593	41.60	3,355	171	11,370	24.15
1936	..	496,530	20,878	42.04	4,001	192	11,877	23.92

OFFICIAL FIGURES

Year		Mean Population	Births		Infant Deaths		Death at all ages	
			No.	Rate	No.	Rate	No.	Rate
1930	..	495,818	17,702	35.70	3,877	219	13,748	27.73
1931	..	445,719	16,488	36.99	3,369	204	11,233	25.20
								Census
1932	..	470,271	16,589	35.28	2,994	181	9,480	20.12
1933	..	477,380	16,881	35.36	2,980	177	9,387	19.66
1934	..	484,963	17,329	35.73	3,107	179	10,162	20.95
1935	..	492,130	19,593	39.81	3,355	171	11,370	23.10
1936	..	490,155	20,878	42.59	4,001	192	11,877	24.23
								Census

It will be seen that Mr. Vlieland's figures give quite a different impression of population changes during the past intercensal period, from what mine do, and on the face of them they look to be more probably true. Mr. Vlieland has reminded me in correspondence during the past four years that death rates do not, as a rule, greatly alter from year to year, and when there is a big rise in the absence of any special death dealing causes, or vice versa, it follows that the estimates of population must be at fault. This very point is well illustrated in the comparison between his figures and mine. But if further proof were required of the strength of Mr. Vlieland's claims beyond his 1932—1935 figures I think it is to be found in his 1936 estimates—a census year. To estimate within a little over 1% should be proof to even the most sceptical. Moreover it is likely that the error does not amount to even that, as it is known that immigration during the latter half of 1936 was excessive, and there is every possibility that the mean annual population for the year was higher than the actual census population recorded on June 30th. It may lie about midway between the two figures.

I am now entirely convinced that Mr. Vlieland has amply proved his case and I intend in future therefore to make use of his methods, or whatever modification of them he himself may suggest, in obtaining my estimates for the intercensal years between now and the Malayan decennial census of 1941.

The only possible objection that can be urged against his methods is that the mean population of any year can only be given after the year is ended, when the births and deaths are known. But this objection is more fancied than real as the official figures are only published in the Annual Report. For ordinary weekly and monthly departmental returns, figures based on the population of the previous year plus the excess of births over deaths should suffice. They could be amended for that matter when the births and deaths for the half year are known. Or perhaps it might be wiser, and this is Mr. Vlieland's suggestion, simply to assume for the time being the same rate of increase as took place in the previous year.

The following return gives the population, the number and rates per 1,000 births, infantile deaths and deaths at all ages for the past 10 years:—

Year	Population	Births		Infantile Deaths		Death at all ages	
		No.	Rate	No.	Rate	No.	Rate
1926 ..	408,273	12,871	31.52	2,987	232.0	13,085	32.04
1927 ..	428,153	14,152	33.05	3,221	227.6	14,165	33.08
1928 ..	442,454	15,540	35.12	3,142	202.1	12,584	28.44
1929 ..	479,723	17,551	36.58	3,467	197.5	12,576	26.21
1930 ..	495,818	17,702	35.70	3,877	219.0	13,748	27.73
1931 ..	445,719	16,488	36.99	3,369	204.3	11,233	25.20
1932 ..	470,271	16,589	35.28	2,994	180.5	9,480	20.12
1933 ..	477,380	16,881	35.36	2,980	176.5	9,387	19.66
1934 ..	484,963	17,329	35.73	3,107	179.3	10,162	20.95
1935 ..	492,130	19,593	39.81	3,355	171.2	11,760	23.10
Average for 10 years ..	462,488	16,470	35.51	3,250	199.0	11,818	25.65
1936 ..	490,155	20,878	42.59	4,001	191.6	11,877	24.23

BIRTHS.

The total number of births registered during the year was 20,878 compared with 19,593 in 1935 and 17,329 in 1934.

There were 10,790 male and 10,088 female births.

The crude birth rate was 42.59 per mille.

The following return gives the number of births and the birth rate for each month of the year:—

Month	Births	Birth Rate	Month	Births	Birth Rate
January ..	1,697	39.96	July ..	1,659	39.07
February ..	1,539	38.74	August ..	1,694	39.89
March ..	1,665	39.21	September ..	1,700	42.23
April ..	1,727	42.02	October ..	2,048	49.23
May ..	1,731	40.76	November ..	1,921	47.71
June ..	1,631	39.69	December ..	1,866	44.85

The following return shows the number of births for each nationality:—

Nationality	Males	Females	Total
Europeans	90	97	187
Eurasians	80	102	182
Chinese	8,846	8,247	17,093
Malays	975	867	1,842
Indians	662	652	1,314
Others	137	123	260
Total ..	10,790	10,088	20,878

There were 588 still births compared with 551 in 1935 and 473 in 1934.

DEATHS.

The total number of deaths for the year was 11,877 and the death rate 24.23 per 1,000.

333 persons died who had been less than 3 months resident in Singapore. Deducting these, the death rate is reduced to 23.55.

The excess of births over deaths was 9,001.

The following return shows the number of deaths and the death rate for each month of the year:—

Month	Deaths	Death Rate	Month	Deaths	Death Rate
January ..	1,038	24.44	July ..	1,047	24.65
February ..	819	20.62	August ..	953	22.44
March ..	849	19.99	September ..	991	24.62
April ..	984	23.94	October ..	961	23.10
May ..	1,143	26.91	November ..	946	23.50
June ..	1,159	28.20	December ..	987	23.72

The death rates for the different nationalities were:—

Nationality	1936			1935		
	Males	Females	Total	Males	Females	Total
Europeans ..	6.41	4.17	5.64	9.36	6.00	8.09
Eurasians ..	12.60	11.72	12.17	10.29	15.98	13.28
Chinese ..	26.88	24.77	26.01	23.82	24.00	23.89
Malays ..	24.97	25.23	25.09	26.50	26.46	26.48
Indians ..	14.12	24.31	16.12	14.77	31.89	17.98
Others ..	16.78	11.29	14.37	17.13	13.83	15.70
Total ..	24.28	24.00	24.23	22.53	24.03	23.10

The following return gives the number of deaths from each cause of disease, by nationality, age and sex. The classification followed is that of the 1931 International List:—

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

[illegible]

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

I Infectious and Parasitic Diseases—(contd.)		Nationality	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals			
			3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL					
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F	
13. Dysentery	11b. Without respiratory complications.	Brought forward		5	2	17	16	12	13	9	11	12	11	16	11	32	14	14	5	7	4	1	3	..	..	159	116	275									
		Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		1	..	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays		..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	(2) Without stated complications.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		1	..	2	..	2	..	1	..	1	..	3	1	2	1	5	6	2	5	4
		Malays		2	..	4	..	2	..	..	..	..	..	1	..	2	1	2	3	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Dysentery	13a. Amoebic.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		..	..	..	..	1	..	..	..	..	..	..	1	..	5	3	11	16	6	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	13b. Bacillary.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		1	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others		..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Erysipelas.	13c. Other or Unspecified.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		..	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	16. Acute Polio-myelitis.	(1) Acute poliomyelitis.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	
			Malays	
			Indians	
			Others	
16. Acute Polio-myelitis.	(2) Acute poli-encephalitis.	Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carried forward		9	3	33	21	18	15	11	9	5	4	6	6	20	20	12	12	21	15	33	18	61	36	51	20	70	26	48	29	..	..	398	234	632			

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

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MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

(16-D)

I. Infectious and Parasitic Diseases—(contd.)		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals	
			M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F			
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
30. Tuberculosis of genito-urinary system.	Brought forward	..	137	142	48	39	29	25	18	13	9	11	14	11	27	25	17	14	44	34	104	51	309	118	310	113	318	86	167	73	..	..	1551	755	2306
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32. Disseminated tuberculosis.	(a) Acute.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	1	..	1	6	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
33. Leprosy.	(c) Not distinguished as acute or chronic.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	2	2	1	1	2
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34. Syphilis.	(a) Congenital Syphilis.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	37	55	7	12	..	2	..	2	1	1
		Malays	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	1
35. Other Venereal diseases.	(b, c) Syphilis acquired or Unspecified.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35. Other Venereal diseases.	(1) Gonorrhoeal or purulent ophthalmia.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

I. Infectious and Parasite Diseases—(contd.)		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals	
			M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F			
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
36. Purulent infection, Septicæmia.	(a) Septicæmia.	Brought forward ..		180	198	56	58	32	30	19	16	10	13	14	14	28	27	17	16	47	34	105	52	319	123	327	117	344	88	186	75	1684	861	2545
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	3	7	4	10	1	1	..	1	1	..	1	..	..	..	..	2	1	..	1	..	..	3	2	1	..	2	2	..	1	..	17	28	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
38. Malaria.	(b) Pyæmia.	Indians	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	1	..	..	..	..	..	..	..	8	1	..	55
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	1	..	2	3	1	5	..	..	..	..	..	..	1	..	1	..	1	..	..	..	..	4	3	..	2	2	..	2	..	14	11	..	27
39. Other diseases due to protozoa.		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..
		Eurasians	3	3	10	8	10	2	2	5	..	4	3	3	12	15	7	9	15	11	34	9	69	33	60	40	53	12	16	15	..	3	294	169	525	
40. Ankylostomiasis.		Chinese	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans
42. Other diseases due to helminths.		Eurasians
		Chinese	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	1	2	1
43. Mycoses.	(2) Other mycosis.	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
44. Other infectious or parasitic diseases.	(5) Mumps.	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carried forward ..		187	210	76	79	44	41	22	23	12	21	18	19	45	51	29	26	68	52	149	64	409	167	404	160	408	102	210	92	..	2081	1107	3188			

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

II. Cancer and Other Tumours.		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals	
			M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F			
			M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F			
			M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F			
Brought forward			187	210	76	80	44	41	22	23	12	21	18	19	45	51	29	26	68	52	149	64	409	167	404	160	408	102	210	92	..	..	2081	1107	3188
45. Cancer of the buccal cavity and pharynx.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	2	..	
	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	
	Malays	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..	1	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
46. Cancer of the digestive organs and peritoneum.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
47. Cancer of the respiratory organs.	Europeans
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48. Cancer of the uterus.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
49. Cancer of other female genital organs.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
50. Cancer of the breast.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

MORTALITY ACCORDING TO DISEASE, AGE AND SEX FOR THE YEAR 1936.

II. Cancer and Other Tumours—(contd.)															Nationality.		Grand Totals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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53. Cancer of other or unspecified organs.	Brought forward																	187	210	76	80	45	41	22	23	12	21	18	19	45	51	31	26	69	52	149	64	412	172	436	170	474	126	257	112	2233	1167	3400																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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54. Non-malignant tumours.	(a) Female genital organs.																	

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

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MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

IV. Diseases of the Blood and Blood-Forming Organs.		Nationality	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals	
			M		F		M		F		M		M		M		M		M		M		M		M		M		M		M		F			
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
70. Haemorrhagic conditions.	(a) Purpura.	Brought forward	222	243	121	110	46	47	22	23	13	21	19	21	48	55	34	26	88	56	194	96	514	252	561	224	608	169	317	144	..	..	2807	1487	4294
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71. Anaemia, chlorosis.	(b) Haemophilia.	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
72. Leukaemia, aleukaemia.	(a) Leukæmia.	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans
		Eurasians	1
73. Diseases of the spleen.	(2) Other diseases of the spleen.	Chinese
		Malays
		Indians
		Others
		Europeans
Carried forward			224	243	124	112	47	49	24	23	13	21	19	21	49	55	35	27	89	56	197	101	520	256	535	224	610	170	318	145	..	..	2834	1506	4340

MORTALITY ACCORDING TO DISEASE, AGE AND SEX FOR THE YEAR 1936.

V. Chronic Poisoning.										Nationality.		Grand Totals																									
Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL							
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F						
77. Chronic poisoning by mineral substances.		224		243	124	112	47	49	24	23	13	21	19	21	49	55	35	27	89	56	197	101	520	256	565	227	610	170	318	145	..	2834	1506	4340			
					
				
				
				
			
VI. Diseases of the Nervous System and Sense Organs.																																					
78. Encephalitis.		(a) Cerebral abscess.		..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
						
					
				
			
79. Meningitis.		(b) Other diseases included under 78.		..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
					
				
			
			
80. Tabes dorsalis (Locomotor ataxy).		(3) Myelitis of unstated origin.		..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
					
				
			
			
81. Other diseases of the spinal cord.		(4) Other diseases included under 81.		..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
					
				
			
			
..		225	243	133	118	49	50	24	23	13	21	20	21	52	55	36	27	90	57	197	101	525	258	569	229	614	171	321	145	..	2868	1519	4887				
Carried forward ..																																					

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

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MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

VI. Diseases of the Nervous System and Sense Organs—(contd.)																												Nationality.																																		
		Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals																												
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F																													
87. Other diseases of the nervous system.	(b) Neuritis, Neuralgia.	Brought forward																												501	437	358	301	113	100	40	43	32	29	25	22	54	56	37	27	94	57	197	101	529	263	579	236	641	187	354	184	3554	2043	5597
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88. Diseases of the eye and Annexa.	(e) Other diseases included under 87.	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89. Diseases of the ear and of the mastoid sinus.	(a) Otitis and other diseases of the ear.	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90. Pericarditis (heart).	(b) Diseases of the mastoid sinus.	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
91. Acute endocarditis (heart).	(1) Malignant endocarditis.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Brought forward	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	502	438	361	302	113	100	41	43	32	29	25	22	54	57	38	27	98	58	197	101	532	264	582	236	643	187	354	184	..	..	3572	2048	5620																										

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

VII. Diseases of the Circulatory System--(contd.)		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
94. Diseases of the coronary arteries, angina pectoris.	(c) Myocarditis not distinguished as acute or chronic.	Brought forward ..	502	438	361	302	113	100	41	43	32	29	25	22	56	60	40	29	109	60	201	110	544	271	613	247	683	204	359	202	..	3700	2117	5817																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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95. Other diseases of the heart	(a) Disordered action of heart.	Europeans	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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96. Aneurysm.	(b) Other diseases included under 95.	Europeans</

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MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

VIII. Diseases of the Respiratory System.		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
			M		F		M		F		M		M		M		M		M		M		M		M		M		M		M		M			M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M		M	

VIII. Diseases of the Respiratory System—(contd.)																														Nationality.		Under 3 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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109. Pneumonia (not otherwise defined).	Brought forward ..																												622	539	672	579	223	190	103	92	83	74	44	51	102	113	46	34	109	68	229	119	632	299	704	274	819	243	574	280	1	..	4963	2955	7918																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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	Chinese	7	3	2	2	4	..	1	1	6	2	4	6	8	6	8	..	2	14	15	21	9	25	6	16	7	117	59																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Malays	1	..	1	1	1	4	3	6	4	6	5	4	2	1	3	25	18																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
110. Pleurisy.	(1) Empyema.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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111. Congestion and haemorrhagic infarct of lung, etc.	(2) Other pleurisy.																											

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

[illegible]

IX. Diseases of the Digestive System—(contd.)			Nationality.		Under 3 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals		
					M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			
117. Ulcer of the stomach or duodenum.	(a) Ulcer of the stomach.	Brought forward ..			626	541	683	583	231	194	103	92	85	77	46	53	110	116	51	41	119	76	250	126	684	324	750	293	891	255	620	299	1	..	5235	3070	8305
			Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
118. Other diseases of the stomach.	(b) Ulcer of the duodenum.	Brought forward ..			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
119 & 120. Diarrhoea and Enteritis.	(1) Inflammation of the stomach.	Brought forward ..			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
121. Appendicitis.	(2) Other diseases included under 118.	Brought forward ..			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
122. Hernia, Intestinal obstruction.	(a) Hernia.	Brought forward ..			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Europeans		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carried forward ..					805	684	886	736	304	257	128	112	105	86	60	60	122	124	55	43	121	79	251	127	679	330	764	302	913	268	639	310	1	..	5833	3518	9351

[illegible]

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

X. Non-Venereal Diseases of the Genito-Urinary System and Annexa—(contd.)			Nationality.		Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals		
					M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F
131. Chronic nephritis.		Brought forward	808	686	892	737	305	257	132	113	106	87	65	61	137	129	60	47	130	86	262	136	713	362	826	321	972	232	672	322	1	..	6081	3626	9707				
			Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	1	1	
			Malays	
132. Nephritis not stated to be acute or chronic.			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
133. Other diseases of the kidney and annexa.	(a) Pyelitis.		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Indians	
134. Calculi of the urinary passages.	(b) Other diseases included under 133.		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Indians	
135. Diseases of the bladder.	(a) Cystitis.		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
			Indians	
136. Diseases of the urethra, urinary abscess, etc.	(a) Stricture of the urethra.		..	..	..	..	..	..	..	..	..	..	..	..													

MORTALITY ACCORDING TO DISEASE, AGE AND SEX FOR THE YEAR 1936.

[illegible]

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

XV. Diseases of Early Infancy.			Nationality.		Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals
					M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
158. Congenital debility.		Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
159. Premature birth.		Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
160. Injury at birth.	(a) With mention of caesarean section.	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
161. Other diseases peculiar to early infancy	(a) Atelectasis.	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
	(b) Without mention of caesarean section.	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
	(b) Icterus neonatorum	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
	(c) Other diseases included under 161.	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
	(c) Other diseases included under 161c.	Brought forward	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401		
			Europeans	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
			Eurasians	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
			Chinese	63	83	11	9	2	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77	96	..	..
			Malays	46	27	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	31	..	..
	Carried forward	Brought forward	1171	1055	935	792	312	263	135	114	108	92	66	61	139	131	63	50	133	93	270	167	738														

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

[illegible]

XIV. Congenital Malformations—(contd.)		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL	Grand Totals	
			3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known				
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			M	F
(b) Spina bifida and Meningocele.	Brought forward ..		828	704	915	772	309	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6394	3959	10358
	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(c) Congenital malformation of heart.	Indians	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	3	6	4	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	9	..
(e) Other congenital malformations.	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
(1) Congenital pyloric stenosis.	Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(3) Imperforate anus.	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(4) Other stated congenital malformations.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(5) Congenital malformation unspecified)	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Chinese	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..
	Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carried forward ..	Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Europeans	851	720	919	776	310	260	134	113	107	91	66	61	139	131	63	50	133	93	270	167	738	417	861	374	1044	320	786	406	1	..	6422	3979	10401	

MORTALITY ACCORDING TO DISEASE, NATIONALITY, AGE AND SEX FOR THE YEAR 1936.

[illegible]

XVII. Deaths from Violence.—(contd.)

XVII. Deaths from Violence.—(contd.)		Nationality.	Under 3 Months		3 to 12 Months		1 to 2 Years		2 to 3 Years		3 to 4 Years		4 to 5 Years		5 to 10 Years		10 to 15 Years		15 to 20 Years		20 to 25 Years		25 to 35 Years		35 to 45 Years		45 to 55 Years		Over 55		Un-known		TOTAL		Grand Totals	
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
186. Accidental injury by fall, crushing, etc.	Brought forward	Europeans	1176	1061	935	793	312	263	135	116	108	94	66	62	140	132	68	50	136	93	275	174	758	425	886	375	1056	323	968	608	1	..	7020	4569	11589	
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	3	..	..
		Chinese	1	1	1	3	3	1	2	..	4	2	19	4	22	2	6	1	7	1	65	15	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	4	..	..
		Indians	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	4	..	2	3	..	1	..	..	12	2	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	3	..	..	..
193 Electricity (lightning excepted).	Brought forward	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others
194. Other and un-stated forms of violence.	(1) Inattention at birth.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	1	1	1
195. Violent deaths of unstated nature (i.e., accidental, suicide, etc.)	Brought forward	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	1	1	..	..	1	..	..	..	..	..	..	..	1	..	1	..	..	1	..	1	4	1	3	..	6	..	..	1	..	..	17	5	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..	..	..	1	..	..	5	1	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
198. Execution.	Brought forward	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	2	..	..	..	..	1	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese
199. Sudden death.	Brought forward	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Malays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Indians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Others	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
200. Cause of death unstated or ill-defined	(1) Heart failure.	Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Chinese	13	6	..	1	..	..	..	..	..	..	..	..														

XVIII. Ill-Defined Diseases.

199. Sudden death.

(1) Heart failure.

200. Cause of death unstated or ill-defined

MORTALITY ACCORDING TO DISEASE, AGE AND SEX FOR THE YEAR 1936.

[illegible]

The following return shows the total number of deaths at different age periods in the different nationalities:—

Mortality According to Nationalities and Ages for the Year 1936.

Nationality	Sex	Under 3 months	3—12 months	1—2 years	2—3 years	3—4 years	4—5 years	5—10 years	10—15 years	15—20 years	20—25 years	25—35 years	35—45 years	45—55 years	Over 55 years	Unknown	TOTAL
Europeans ..	M	1	2	—	—	—	1	—	—	—	6	6	4	9	6	—	35
	F	2	—	—	—	—	—	—	—	—	—	1	1	2	6	—	12
Eurasians ..	M	9	5	1	—	—	—	2	—	2	2	2	5	3	13	—	44
	F	9	2	—	1	2	—	1	—	2	1	7	—	3	15	—	43
Chinese ..	M	991	799	257	115	96	60	125	62	100	223	634	758	906	793	3	5,923
	F	910	682	222	93	76	59	118	48	67	125	344	316	258	490	1	3,809
Malays ..	M	129	95	37	18	11	5	11	7	13	19	53	59	56	96	—	609
	F	102	79	28	15	9	2	13	5	17	28	55	45	42	82	—	522
Indians ..	M	53	30	17	5	2	2	5	6	22	36	105	92	94	69	—	538
	F	51	25	15	6	6	2	2	1	7	21	28	19	20	23	—	226
Others ..	M	11	5	1	—	1	—	1	—	4	3	10	11	15	10	4	76
	F	3	6	1	2	2	—	2	—	2	4	3	3	6	6	—	40
Total ..	M	1,194	936	313	138	110	68	145	75	141	289	810	929	1,083	987	7	7,225
	F	1,077	794	266	117	95	63	136	54	95	179	438	384	331	622	1	4,652
Grand Total ..		2,271	1,730	579	255	205	131	281	129	236	468	1,248	1,313	1,414	1,609	8	11,877

GENERAL DEATH RATE.

The crude death rate for the year was 24.23 per 1000 living compared with 25.20 in 1931.

Though, as already pointed out, there is reason to believe that, owing to excessive immigration in the second half of the year, the mean annual population was rather higher than that enumerated on the night of June 30th, I have, nevertheless, used the Census figure in calculating the above rate.

It should be noted, too, that in drawing a comparison, I have done so only with a previous Census year. The reason for this is obvious from what I have said under Vital Statistics and in future I think comparisons between successive years should be avoided, unless the estimates of population have been calculated by the methods now adopted.

The chief causes of death are set out in the following table. The 1931 figures are given for comparison:—

	1936		1931	
	Cases	Rate per mille	Cases	Rate per mille
Bronchitis & Pneumonias	1,990	4.060	1,525	3.421
Tuberculosis	1,406	2.869	1,377	3.089
Infantile Convulsions (up to 5 years)	1,056	2.154	1,193	2.676
Diarrhoea & Enteritis ..	912	1.861	782	1.754
Beri-Beri	767	1.565	651	1.460
Diseases of Early Infancy	707	1.442	658	1.476
Nephritis	546	1.114	448	1.005
Malaria	525	1.071	551	1.230
Dysenteries	241	.492	432	.969

There are only two causes of death in the above table to which I wish to refer this year. These are the two groups, Bronchitis and Pneumonias, and Tuberculosis. The latter group is as usual composed of 90% Phthisis deaths. I will also remind my readers that, though there may be errors of diagnosis in each group, owing to the fact that many deaths are certified on a view only, taking the two groups together, the margin of error is likely to be small. And taken as a measure of the evil effects of overcrowding these deaths together are quite a reliable guide.

It will be seen at once that there has been a set back over the five years. In 1931 the two groups were responsible for 25.8% of all deaths and a rate per 1,000 living of 6.51 whereas in 1936 they caused 28.6% and the rate was 6.93.

Despite the fact that, during the past few years, the Improvement Trust has been throwing open back lanes and reconstructing the backs of houses to give more air and ventilation, and to permit of the installation of modern sanitation, with all due respect to that body, it is not even holding its own in the attack on overcrowding. Dark, unlit, insanitary cubicles are, if anything, more numerous than ever and the housing conditions are no better than they were when the Housing Commission sat nearly twenty years ago. New housing has not kept pace with the literally enormous increase in family life that the last decade has seen. To quote one figure alone: in 1926 there were only 540 Chinese females to 1,000 males but in 1931 that figure had risen to 587 and in the year under review to 698 and in the same period the crude birth rate has risen from 31.52 in 1926 to 42.59 today.

Another proof of the increased family life is obtained from statistics collected by the Infant Welfare department. In 1931, 14,996 mothers, representing 90% of all births, were visited and 11,470 or 76% were reported as living in cubicles or single rooms, but in 1936, of 18,304 women, representing 88% of all births, 14,614 or 79% were so housed.

The real truth is that Singapore has only about half the number of domestic dwellings which it ought to have, to house its poorer classes decently. The Improvement Trust tries to lead the way by opening up new areas and building sanitary houses. These have been immediately occupied but private enterprise is still slow to follow.

And that will always be so, I am afraid, while it remains possible to cram the existing houses with insanitary cubicles. Due to this overcrowding, and to nothing else, these old houses command a return, I do not say all of it to the owner, out of all proportion to their value, and which no prospective builder could hope to receive for new and sanitary property. Some very powerful stimulus indeed is required to encourage fresh building on the scale necessary. I begin to fear that this impetus can only be got by the extremely drastic step of demolishing forthwith all insanitary cubicles and literally turning people out on the streets.

But before we even begin to think of such a step some very drastic amendments of the law in regard to cubicles will be necessary. The present law, like much more of the Municipal Ordinance, is good—on paper only.

It should always be remembered in considering our mortality rate that Singapore, from its geographical position and its hospital and other facilities, is a clearing house for the Peninsula and surrounding islands, and that it is, in consequence, saddled with a varying number of external deaths that really do not belong to it. I referred briefly to this under Vital Statistics and quoted the great fall in the Chinese male death rate from 1926 to 1931 in proof of this. And this is always amply borne out in any special investigations made into certain diseases. It is invariably found with malaria for instance, which is always carefully checked, that a large percentage of the patients come from outside Municipal limits.

This factor in our death rate is less evident in times of slump when labour forces up-country are reduced to a minimum, and for that reason I am of opinion that the truest death rates, so far as the static population is concerned, are to be found in the years 1931—1933 inclusive, as shown in Mr. Vlieland's estimates.

Before leaving the subject of the general death rate, I should like to say that I am led to understand that the crude death rates published in my reports for the last five years may have given a misleading impression of the trend of the public health. The revised crude rates based on Mr. Vlieland's estimates, even without further correction, give little encouragement to any idea that there has been a marked deterioration in health since 1933.

When I say without further correction I have in mind one factor that must have had a big influence on the death rates in the past decade. I refer to the fact that, following on the disproportionate increase in the number of women, there has been an enormous increase in the infantile proportion of our population. These infants, being subject to a much higher rate of mortality, must have adversely affected the general death rate. I am somewhat diffident, naturally perhaps, of elaborating this point too much but I would draw attention to the following figures which are self explanatory:—

		1936	1931	1926
Infantile Death Rate	.. ..	191.6	204.3	232
Percentage of Infant deaths of all deaths	..	33.7	30	22.8
Infant death rate per 1,000 population	..	8.162	7.558	7.311
General death rate	.. ..	24.23	25.02	32.04

Mr. Vlieland, who has no professional interest in the health of Singapore and is entirely impartial, assures me he finds nothing in the mortality statistics to suggest any set back in the steady improvement of the general level of public health. He points out that this alteration of the age distribution of the population, with other factors which he enumerates, must have for the time being a seemingly adverse effect on the general death rate. He has also supplied me with partially corrected and standardised death rates over the past ten years, which take into account this one main factor of increased infant population and perhaps I shall publish such a correction in future. Meantime, I desire to acknowledge here my warm appreciation of his great assistance and interest.

INFANTILE DEATH RATE.

This was 191.6 per 1,000 live births. The rates in 1935 and 1934 were 171.2 and 179.3 respectively.

The rise over last year's figure is at first sight disappointing, but it is quite possible that it may be explained by the fact that during the year many Chinese immigrant mothers brought in young infants, deaths amongst whom are not offset by a corresponding number of registered births. It is a significant fact that the whole increase is entirely accounted for by the increased Chinese rate, while Malay and Indian rates both show big improvements, as will be seen in the following table which gives the infantile death rates by nationalities for the past ten years. These rates, of course, are not subject to the same criticism as general death rates as they are compiled from registered births and deaths.

INFANTILE MORTALITY BY RACES—1926 to 1936.

Year	Europeans	Eurasians	Chinese	Malays	Indians	Others	All Races
1926 ..	38.1	166.6	225.0	329.0	207.9	164.7	232.0
1927 ..	14.6	130.4	219.2	355.2	200.5	105.2	227.6
1928 ..	52.4	173.9	201.1	270.9	154.6	44.3	202.1
1929 ..	50.4	134.3	191.4	292.1	169.5	107.0	197.5
1930 ..	40.3	171.9	217.4	290.4	190.9	37.9	219.0
1931 ..	28.7	110.0	204.6	265.6	159.1	104.8	204.3
1932 ..	6.1	67.0	181.6	254.9	109.8	86.9	180.5
1933 ..	33.0	121.6	176.1	246.0	128.5	88.6	176.5
1934 ..	27.2	109.4	176.6	267.6	133.2	88.9	179.3
1935 ..	13.8	80.0	172.4	225.7	136.0	86.9	171.2
1936 ..	26.7	137.4	197.8	219.9	121.0	96.1	191.6

It is immediately apparent from the table that the increased Chinese rate more than accounts for the whole increase. And in all probability the reason advanced for the increased rate is the correct one, as otherwise it is difficult to account for the interruption of the steady progress of this race in the past six years. Indirect corroboration of this too may be found in the improved Malay rate, always a sensitive index of infant mortality, and always the highest individual rate. The figure 219.9 constitutes a low record for the Malay race and is to me a great source of satisfaction as I feel sure that the whole of the credit of the great improvement in the last ten years must go to the Infant Welfare department.

The main causes of death and rates per 1,000 births for each group are set out in the following table, the 1935 figures and rates being given for comparison:—

	Cases	1936	Cases	1935
		Rate per mille		Rate per mille
Convulsions ..	854	40.904	703	35.880
Bronchitis & Pneumonia ..	820	39.275	813	41.494
Diseases of Early Infancy	697	33.384	577	29.449
Diarrhoea & Enteritis ..	640	30.654	490	25.008
Tetanus ..	262	12.550	189	9.646
Beri-Beri ..	139	6.657	57	2.909
Congenital Syphilis ..	111	5.316	147	7.502
	3,523	168.740	2,976	151.888

From the above it will be seen that the increased mortality was not due to any specific disease, which incidentally is only another proof that the increase is more apparent than real. There is a surprising fall in the Bronchitis & Pneumonia rate but all the other main causes of death show increased rates.

Regarding infantile Beriberi I should like to say that in my opinion the number of deaths from this cause is probably very much higher than that recorded. In the Infant Welfare Department over the past few years a wealth of evidence has been accumulated, which goes to show that this disease is extremely prevalent, both in expectant mothers and in newly born infants. In all probability many of the deaths appearing under such causes as Convulsions and Diseases of Early Infancy might more properly be referred to Beriberi. Fuller particulars of this observation will be found in the report of the Lady Medical Officer.

Between the cases of Congenital Syphilis, the investigation into which was recorded in my report for last year and these cases of Beriberi, there is a wonderful field for an extension of the Infant Welfare department in the direction of ante-natal work, and a field in which results might confidently be expected almost immediately.

V. CERTIFICATION OF DEATHS.

The following return shows the number of deaths, the causes of which were certified by Medicalmen, Inspecting Registrars and the Coroner respectively:—

		Eurasians	Europeans	Chinese	Malays	Indians	Others	Total
Medicalmen	..	34	69	6,908	322	515	95	7,943
Registrars	..	2	13	2,282	798	187	8	3,290
Coroner	..	11	5	542	11	62	13	644
Total	..	47	87	9,732	1,131	764	116	11,877

This gives a percentage of 66.9 certified by medicalmen as against 65.7 last year, 27.7 by Registrars as against 28.7 last year and 5.4 certified by the Coroner as against 5.6 last year.

The percentage for the 10 years has been as follows:—

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Medicalmen	63.6	65.1	66.0	68.2	63.6	63.5	64.5	62.8	65.7	66.9
Registrars	30.1	28.9	29.1	28.4	31.6	29.6	29.0	31.1	28.7	27.7
Coroner	6.2	5.9	4.8	3.3	4.8	6.8	6.5	6.1	5.6	5.4

There were 20,878 births and 11,877 deaths registered at the Registry of Births and Deaths. 23 births and 2 deaths were entered in the post registration books, and the sum of \$186 was received in late registration fees.

VI & VII. ANALYTICAL AND BACTERIOLOGICAL LABORATORIES.

Both reports are appended and should be published in full for the benefit of other similar laboratories in the East.

In addition to the usual large number of routine public health samples, the officers in charge of both laboratories found the time to carry out several pieces of useful research, of great value to the Health department, and for the benefit of the public generally.

I congratulate both officers on the continued high standard of the work performed in both laboratories.

VIII. ANTI MOSQUITO WORK.

Dr. Dawson's report is appended. Full details will be found there.

New Works. Preliminary ditching, draining of vegetable ponds and lowering the water table generally were carried out in the latter half of the year in the valley floors of four large ravines on the north bank of the Whampoa. *A. maculatus* had always been found breeding in the upper reaches of these ravines, while there has always been extensive breeding of ordinary irritative culicines in the ponds. As this area is sparsely populated it was decided some time ago to wait for the deepening and widening of the Whampoa, before putting the drainage of the area in hand, but, as this latter operation has been so long postponed, and the ordinary culicine breeding was heavy, it was felt we could not put off longer.

The *maculatus* areas will be subsoil piped at once, and, when the work on the Whampoa has been carried out, the permanent drainage, involving the replacing of the ditches by concrete channels, will be completed.

This preliminary work involved the cutting of 4,520 yards of ditches while the water was released from 80 ponds.

The biggest undertaking by the department during the year was the cleaning up of the *A. Sundaicus* breeding grounds in the basins of the Whampoa, Kallang and Gelang Rivers. It will be remembered that, following on a sharp outbreak of malaria in the latter part of 1935, it was decided that a serious attempt must be made to abolish these breeding grounds.

A start was made in February and, as a preliminary, the containing bunds of the numerous fish ponds were broken down to admit tidal water. This had the immediate effect of dissipating the bulk of the breeding. But there remained many ponds, and especially vegetable ponds, on the extreme limits of the tide where this simple measure could not be employed. These were dealt with in a variety of ways. Some were filled with the spoil from broken down bunds—but most of them

were treated by bunding off large areas—connecting up the ponds in the area to each other by deep drains, these in turn discharging to bigger drains protected by tidal flaps at their exits in the bunds. Finally the whole area was gone over, filling up inequalities, freeing the ponds of all vegetable growth and trimming their margins to give a straight cut edge to ensure every chance to any larvae eating fish.

In the process, 165 fish ponds were made tidal involving the breaking down of 6,839 yards of bund: 33 fish ponds and 540 vegetable ponds were dealt with by the other methods outlined above, involving the construction of 2,254 yards of new bund, 4,717 yards of main ditches, 8,360 yards of subsidiary ditches, and the provision of 8 tidal gates.

8 gangs of 20 men each, later increased to 11, were employed on this work while an intensive oiling campaign was also carried on throughout the year.

In connection with this special campaign against *A. sundaicus*, a mosquito trap was in continuous use throughout the year near the Swimming Club. Before the bunds were broken down the *sundaicus* catch was quite big, but coincidently with the breaking down of the bunds their numbers rose enormously. Thereafter, however, the numbers caught steadily diminished, until by the end of the year on many nights not even a single one was caught. This to my mind is a proof that most of the *sundaicus*, which infested Katong, and caused malaria there, came from the Kallang Basin. It is not denied that there has been and must always be, from the nature of the land, a small amount of *sundaicus* breeding in the Geylang Basin, much nearer to Katong, but it can never be more than sufficient to account for more than an odd sporadic case in that district.

In my original report on this *sundaicus* breeding I recommended that the Kallang Basin area, where the worst of the breeding was taking place, must be sterilised. Every spadeful of soil turned over in this area is a potential breeding ground, and, until the ideal of reclamation and filling can be carried out, all activities whatsoever, which involve the turning over of the soil, must be prohibited. In pursuance of this policy over 350 huts belonging to the fish pond owners and vegetable gardeners were demolished and the occupants evacuated. As reasonable compensation was paid, no undue difficulty was experienced in this respect. At the end of the year, I am glad to say, negotiations for the purchase of over 150 acres of the worst of the land were nearing a successful completion. Once the land is our own, the keeping down of dangerous breeding to a minimum will be rendered much easier. Nevertheless, the control of this area will throw a heavy strain on the department for many years to come, and I hope it will receive all possible backing in its insistence on keeping this area sterilised.

Extensions and repairs in existing areas involved the laying of 3,544 yards of concrete channels of varying sizes, 4,000 yards of concrete slab revetment and 4,354 yards of subsoil pipes.

MAINTENANCE. During the year 7 gangs of 20 men each were constantly employed on the routine maintenance of the existing areas, 2 gangs on minor works and repairs, and 2 gangs on Patrol work in the Katong and Siglap districts.

49,343 gallons of anti-malarial mixture were expended during the year—mostly in connection with the sunaicus breeding grounds.

IX. SUPERVISION OF MIDWIVES AND INFANT WELFARE.

The report of the Lady Medical Officer is appended. It makes interesting reading and should be published in full.

The District Sisters and Staff Nurses paid 26,062 visits to 18,304 mothers in their homes. This is a big increase over the 1935 figure, which in turn was much higher than the 1934 figure. The four district nurses engaged in this were greatly overworked and it is now essential that another be appointed and the town divided into five districts instead of four. Otherwise many essential revisits to sick mothers must be cut out.

Of the above mothers, 14,614 or 79.8% were reported to be living in cubicles or single rooms.

4,154 or 22.7% of the mothers visited had no skilled attention at birth.

The total number of deaths associated with Pregnancy, Childbirth and the Puerperal state was 85. Of these, 26 were due to Puerperal Sepsis.

18,439 (135 pairs of twins) births were reported to the Clinics, i.e. 88.3% of all births. 17,566 were actually seen by the District Staff.

17,418 babies were taken on the Clinic registers against 16,015 in 1935. The Clinic Staff held 46,388 consultations in the Clinics and paid 117,064 visits in the homes.

All tetanus cases reported were investigated by the Clinic Staff. It is significant that in all cases the mothers of these children had had no skilled attention at birth.

I invite special attention to Dr. Clark's comments on Congenital Syphilis, but more especially to what she writes about the great prevalence of ante-natal and post-natal beriberi. I repeat here that, in the prevention of these two conditions alone, there is a fruitful field for successful ante-natal work, and no time should be lost in providing both the staff and the finance to undertake it.

X. FOOD AND MARKETS.

The report of the Food and Market Inspector is appended.

The improvement in trade and return of prosperity generally was reflected in the greatly increased amounts of foodstuffs passing through the markets. Fish, for instance, showed an increase of approximately 270 tons, beef a 20% increase and mutton 16%. Prices, if anything, showed a fall over those obtaining in 1935.

Market revenues were up by approximately \$4,000, but 75% of the increase was due to the increased commission on the sale of fish.

All markets were reasonably busy with the exception of Joo Chiat in the Siglap district. It continues to suffer to a much greater extent

than any other market from the many itinerant, mostly unlicensed, hawkers that infest the district.

In the markets, approximately 57¼ tons of unsound foodstuffs, 14 tons being fish, were seized or surrendered, and in shops and stores in the town 16,163 items, representing a gross weight of over 100 tons. All were sent to the Incinerator to be destroyed.

FOOD SHOPS, ETC.

Licences were issued for:—

	1935	1936
Eating Houses	921	936
Coffee Shops	220	208
Soda Fountains	43	88
Meat and Fish Shops ..	142	147
Bakeries	22	22
Cake Shops	37	33
Biscuit Factories	5	5
Aerated Water Factories ..	8	9
Milk Vendors	217	194
Iced Water & Cold Drinks	—	33
Food Caterers	—	2
Food Shops	—	14

All were regularly inspected by the District Sanitary Inspectors.

XI. PLACES OF PUBLIC RESORT.

Theatres, Hotels, Public Houses, Lodging Houses, Schools, etc. were regularly inspected and the necessary reports submitted at the request of the various licensing authorities.

XII. SLAUGHTER HOUSES.

During the year 301,699 animals were slaughtered in the Municipal Abattoirs. They were as follows, the 1935 figures being also shown.

	1935	1936
Pigs	240,349	248,819
Sheep	36,835	34,917
Goats	2,948	3,432
Oxen	14,889	14,447
Buffaloes	227	84
Total	295,248	301,699

1982 carcasses were totally condemned, 1873 being pigs, 47 sheep, 25 goats, 35 oxen and 2 buffaloes. Of the pigs, 775 were suffering from *Cysticercus Cellulosae*, 433 from Pyrexia, 413 from Swine Fever and 19 from Tuberculosis. Of the oxen, 9 were suffering from *Cysticercus Bovis*, 11 from emaciation so pronounced as to be pathological, and 4 from Tuberculosis.

There was evidence of tuberculosis in the carcasses of 1,312 pigs and 30 oxen.

During the year, a change was made in the method of letting the space at the Storage Depot. Certain pens were let out at a monthly flat

to the bigger importers resulting in much more use being made of the Depot.

XIII. OFFENSIVE TRADES.

397 licences, 335 of them being for laundries, were issued during the year, the fees drawn being \$2,862.84. All these licensed premises were regularly inspected.

XIV. BURIAL GROUNDS.

There were 9,330 burials inside municipal limits during the year, the nationalities being as follows:—

Europeans	..	..	68
Eurasians	..	..	101
Chinese	..	..	7,154
Malays	..	..	1,431
Indians	..	..	546
Others	..	..	30
Total			9,330

There were 56 exhumations during the year, all carried out under the supervision of the Burial Ground Inspector. This officer also paid 1,447 visits of inspection to municipal and other cemeteries.

There were 83 cremations.

Of the total burials above, 8,398 took place in the 6 Municipal Cemeteries and the remainder in some of the 16 Private and 17 Public Cemeteries still in use.

XV. STAFF.

The writer went on leave in May returning in October. Dr. Hutchinson went immediately I returned. Mr. McMorine went on leave in January returning in September. Mrs. Stott went on leave in July. Mr. Clark returned from leave in January and Mrs. Nyborg in June.

Dr. Mary Tan took up duty as Assistant Lady Medical Officer in January. Messrs. J. Ferguson, A. G. Valberg, P. E. Taye and Lim Khng Seng were appointed Probationary Sanitary Inspectors in July.

Inspector E. C. Mathiew was seconded to attend the Royal Sanitary Institute Course and was successful in obtaining the diploma.

Mr. E. E. de Souza, one of the Senior Sanitary Inspectors, retired in December on attaining the age limit.

HEALTH OF MUNICIPAL SUBORDINATE STAFF.

The number of cases treated was 21,011. There were 542 sent to hospital and 473 to various clinics. 406 were treated by private practitioners. 44,170 days sick leave were granted, 23,881 dressings were applied at the office dispensary where the daily attendances totalled 51,061.

The chief causes of invaliding were Influenza (5,866), Pyrexias (3,615), Accidents and Injuries (2,444) and Bronchitis (1,023). The total number of first attacks of Malaria was 418.

XVI. GENERAL.

There were 2,233 notices including 206 intimations served during the year. 502 notices were brought forward from last year making a total of 2,735. Of these, 2,068 were complied with, 30 cancelled and 637 carried forward.

There were 26,696 visits of inspections paid by the Sanitary Inspectors. 973 prosecutions, 832 convictions with fines imposed amounting to \$3,231.75 while 51 prosecutions were withdrawn and 90 summonses could not be served.

The following reports and returns are appended:—

- Anti Mosquito Report.
- Report of the Analyst.
- Report of the Bacteriologist.
- Report of the Lady Medical Officer.
- Report of the Superintendent Middleton Hospital.
- Report of the Market Inspector.
- Return of Inspectors' prosecutions.
- Return of Notices.
- Return of licences for Offensive Trades.

In conclusion, I wish to record my appreciation of the loyal support of all members of the department. For many of the outdoor staff especially, the year was a hard one. The nature of the work in the Kallang Basin was particularly trying. Quite apart from the swampy nature of the ground, the operation involved the dishousing of over 2,000 people, and it says much for the tact of those engaged in the work that it was carried out with a minimum of friction.

I also wish to congratulate all officers, and especially Mr. Benjafield, the Chief Sanitary Inspector, for the very efficient and accurate manner in which the Census enumerations were recorded.

I have the honour to be,

Sir,

Your obedient servant,

P. S. HUNTER,

M.A., M.B., Ch.B., D.P.H.,

Municipal Health Officer.

(56-D)

MUNICIPAL HEALTH OFFICE,
SINGAPORE, *13th February, 1937.*

THE MUNICIPAL HEALTH OFFICER,
SINGAPORE.

Sir,

I have the honour to forward the following report on anti-mosquito measures carried out in the Municipal Area during the year 1936.

ANTI-MALARIAL WORKS.

Permanent drainage and extensions of existing works were carried out in the following areas:—

AREA NO. 130 MOUNT WASHINGTON RAVINE.

The laying of a concrete anti-malarial type channel in this area was continued throughout the year and completed in November. General levelling of the floor of the ravine, sloping of the banks and spotturfing was carried out. At the head of the main ravine, where there was out-cropping of large granite boulders and cascading of water down a steep slope, an eighteen-inch concrete culvert was constructed for a distance of 56 feet, and six large concrete steps each six feet long and four feet high with concrete supporting walls were built over the granite boulders. All permanent seepages were trapped by subsoil pipes. In the main ravine and subsidiary ravines, 168 twelve-inch concrete inverts, 125 fifteen-inch inverts, 516 eighteen-inch inverts, 1,139 twenty-one inch inverts, 192 fifteen-inch concrete revetment slabs, 4748 eighteen-inch slabs, 5481 four-inch subsoil pipes, 562 six-inch pipes and 2559 eight-inch pipes were laid.

AREA NO. 110 MCRITCHIE RESERVOIR.

Several dangerous seepages in this area were dealt with by laying 982 four-inch subsoil pipes and 310 six-inch subsoil pipes as an extension to the original works.

AREA NO. 55 FORT CANNING.

A dangerous permanent seepage on this area was drained by laying 112 six-inch subsoil pipes.

AREA NO. 35 TIONG BAHRU.

The low lying area between the old asylum and Peng Guan Street was drained by laying 210 four-inch and 50 eight-inch subsoil pipes. Numerous pools and unnecessary earth drains were filled in and 250 yards of earth drain were cut.

AREA NO. 74 MCKENZIE ROAD.

Dangerous seepages, in which larvae of *Anopheles maculatus* were found, were drained by laying 180 four-inch subsoil pipes and 25 six-inch concrete inverts.

AREA NO. 30 ORCHARD ROAD.

The upper portion of the existing concrete channel in this area was diverted and relaid for a distance of 83 yards and the cost charged to the property owner at whose request this work was carried out.

AREA NO. 26 MOSQUE RAVINE.

Disturbance of the original subsoil pipe line by the erection of a new house in the centre of this ravine necessitated the laying of 315 four-inch subsoil pipes to trap outcropping seepages.

AREA NO. 69 BALESTIER ROAD RAVINE.

Fresh seepages in this area necessitated the laying of 138 six-inch subsoil pipes.

AREA NO. 68 PEARL'S HILL.

72 four-inch subsoil pipes were laid to deal with new dangerous seepage in this area.

AREA NO. 121 ALEXANDRA ROAD 'BRICK FACTORY RAVINE.'

New outcropping seepages, in which larvae of *Anopheles maculatus* were found, were dealt with by laying 350 four-inch subsoil pipes.

AREA NO. 115 ALEXANDRA ROAD.

The existing subsoil pipe line in this area was extended by laying 250 six-inch subsoil pipes.

Dangerous seepages near the rifle range were trapped by laying 290 four-inch subsoil pipes.

AREA NO. 34 SHANGHAI ROAD.

The existing subsoil pipe line in this area was extended by laying 120 four-inch subsoil pipes.

AREA NO. 18 HAMMER'S RESERVOIR.

Subsequent to the discontinuance of the use of this reservoir as a source of water supply, the main anti-malarial drain was extended by laying 72 eighteen-inch concrete inverts and 150 eighteen-inch revetment slabs. Seepages in the floor of the old reservoir were trapped by laying 110 four-inch subsoil pipes.

AREA NO. 117 TELOK BLANGAH ROAD RAVINE.

The anti-malarial drain in this area was extended in order to connect up sullage drainage and to deal with several permanent seepages. 196 fifteen-inch concrete inverts, 126 eighteen-inch concrete inverts, 2 twenty-one inch inverts, 523 fifteen-inch revetment slabs, 106 eighteen-inch revetment slabs, 25 four-inch subsoil pipes and 112 six-inch subsoil pipes were laid.

AREA NO. 16 TYERSALL POND.

The original concrete subsoil pipes which were corroded were taken up and replaced by 180 six-inch fired clay pipes.

AREA NO. 116 SUNGEI WHAMPOE.

Work necessary for the abolition of known breeding places of *Anopheles sunaicus* on Government and Improvement Trust land between Kim Keat Road and St. George's Road was carried on throughout the year. A small area south of the Sungei Whampoe was drained and levelled and a twenty-one inch tide gate was constructed in the bed of an old creek on the northern bank of the stream. Main earth ditches were cut through the area from the tide gate for a distance of 1,600 yards and subsidiary earth drains for a distance of 1,834 yards. 315 ponds were drained and filled or partly levelled off.

AREA NO. 134 BENDEMEER.

This area includes the ponded land surrounding the Bendemeer Estate and the ponded land on the small island of Pulau Minyak, and the whole area was the source of much breeding of *Anopheles sunaicus* (ludlowi). Bunds were breached where necessary and areas that could be made freely tidal were left in that condition. Sea water was cut off from ponds on higher ground by laying two eighteen-inch tide gates. A new earth bund was erected for a distance of 300 yards and the ponds were drained by cutting 917 yards of earth drains leading to these gates.

AREA NO. 104 GEYLANG BASIN.

The low lying area, immediately north of Grove Estate, which is protected by permanent tide gates, was brought under more satisfactory control by raising the general level of the lowest portion of the area by approximately eighteen inches. *Anopheles sunaicus* (ludlowi) larvae were collected in the low lying land south of the lorongs in Geylang Road and between these lorongs and the bunded area. These breeding places were created by squatters engaged in prawn fishing, constructing bunds and interfering with the free flow of tidal water from the Geylang River. Notices were served requiring demolition of these bunds and 3,633 yards of earth bund were demolished.

AREA NO. 133 KALLANG BASIN.

This area includes all the land lying within the boundaries of Serangoon Road, McPherson Road, Aljunied Road, Sims Avenue and Lavender Street with the exception of the section surrounding Bendemeer Estate and the island of Pulau Minyak. Much of the area was comprised of a network of ponds created in the past by the excavation of clay for brick and tile making or by erecting bunds on former tidal land or by blocking natural tidal creeks. All of these ponds formed breeding places of *Anopheles sunaicus* (ludlowi). Bunds were breached wherever possible and a large section of this area was rendered freely tidal. The margins of all ponds were cleared of undergrowth and the edges were made as clear cut as possible.

A large number of ponds on the outskirts of the tidal area, and used by vegetable gardeners as a water supply and for growing water hyacinth for pig food, were connected up by deep earth drains to tide gates opening into tidal waters. In carrying out this work 2,200 yards of main

earth drains and 6,526 yards of subsidiary drains were constructed and 5 tide gates were installed.

Areas No. 135 Kim Keat Road Ravine,
No. 136 Boon Teck Road Ravine, No. 137
Tai Gin Road Ravine and No. 138 Ah
Hood Road Ravine.

These areas comprise four ravines draining into the right bank of the Sungei Whampoe between Kim Keat Road and Thompson Road, and having breeding places of *Anopheles maculatus* at the heads of the valleys and much breeding of *Anopheles hyrcanus* and culicines in ponds lower down the valley. The preliminary work of clearing the floor of these ravines of trees and undergrowth, of draining all ponds and cutting main earth ditches through the lowest part of the ravine floor was commenced in all four ravines. 4,520 yards of main earth drains and 2,250 yards of subsidiary drains were cut and 80 ponds drained.

Work is in progress.

AREA NO. 139 KAMPONG WAK TANJONG.

This area is bounded by Aljunied Road, McPherson Road, Payah Lebar Road and Sims Avenue.

Two brick yards were in operation in this area some years ago and as a result of excavating the land for clay some 31 acres of the area were converted into a network of ponds in which larvae of *Anopheles sundaicus* (ludlowi) were found in large numbers.

Levels were taken out from the culvert under Payah Lebar Road near the Fire Station through the Kampong, to the ponds, and it was found that the majority of the breeding places could be dissipated by a combined scheme of levelling and draining.

During December existing earth drains were deepened and widened for a distance of 880 yards towards the site of the ponds, and 10 small ponds were drained by cutting 1,266 yards of earth drains.

Work is in progress.

MINOR EXTENSIONS AND REPAIRS.

Minor extensions and repairs to existing areas called for the laying of 131 yards of nine-inch, 309 yards of twelve-inch, 354 yards of fifteen-inch, 841 yards of eighteen-inch, 321 yards of twenty-one inch concrete channel, 7 fifteen-inch and 616 eighteen-inch concrete revetment slabs, 93 yards of four-inch, 86 yards of six-inch, and 39 yards of eight-inch subsoil pipes.

MAINTENANCE.

Routine maintenance consisting of clearing and grass cutting was carried out in all the existing anti-malarial areas.

MOSQUITO SURVEYS.

Systematic surveys of the Municipal Area were regularly carried out and 3,569 collections of mosquito larvae were examined and identified in the laboratory.

Collections of adult mosquitos were made during the year by means of mosquito traps and the following tables show the recorded catches of female anophelines:—

MOSQUITO TRAP ON KATONG SEA FRONT.

Month.	Species caught					Number of nights. which trap was set.	Average catch per night.
	Anopheles sundaicus (ludlowi)	Anopheles vagus	Anopheles hyrcanus	Anopheles tesellatus	Anopheles kochi		
January ..	375	12	1	1	..	22	18
February ..	240	6	..	..	..	23	11
March ..	5	..	..	..	..	26	..
April ..	30	1	..	..	..	22	1
May ..	45	1	1	..	..	25	2
June ..	32	..	..	..	..	24	1
July ..	15	1	..	..	..	25	..
August ..	28	1	..	..	..	25	1
September ..	79	..	..	..	..	26	3
October ..	15	1	..	..	..	25	..
November ..	44	1	..	2	1	24	2
December ..	32	12	..	..	..	12	..

MOSQUITO TRAP IN KALLANG BASIN.

April ..	53	6	1	..	..	4	15
May ..	145	1	1	..	..	8	18
July ..	105	4	..	1	..	19	6
August ..	68	..	..	..	..	25	3
September ..	152	1	..	..	..	23	7
October ..	26	..	6	..	4	24	2
November ..	3	..	..	..	..	3	1

MOSQUITO TRAP AT KIM KEAT ROAD.

May ..	5	37	12	2	..	7	8
June ..	20	229	5	5	..	18	14
July ..	3	62	0	0	..	4	16

MOSQUITO TRAP AT ST. MICHAEL'S ROAD.

November ..	20	11	23	12	61	18	7
December ..	1	6	15	2	8	12	..

MOSQUITO TRAP IN LORONG 29, GEYLANG.

September ..	206	7	312	3	3	18	30
October ..	201	11	459	1	30	25	29
November ..	12	8	366	3	40	23	19
December ..	5	10	58	2	11	21	..

Of the adult mosquitos trapped 2,157 were dissected and examined for malarial infection.

Two *Anopheles sunaicus* (ludlowi) trapped in Kallang Basin in September were found to be infected in the mid-gut. Two *Anopheles sunaicus* (ludlowi) and one *Anopheles hyrcanus* trapped in Lorong 29 Geylong in October were found infected in the mid-gut and one *Anopheles sunaicus* was found to have a salivary gland infection.

GENERAL ANTI-MOSQUITO WORK.

285,476 yards of earth drains were cleared and regraded by patrol gangs, and these gangs collected and disposed of 8,496 large baskets of empty tins. 49,343 gallons of anti-malarial mixture were used in spraying mosquito breeding places principally in the Kallang and Geylang River basins.

836 notices under the Destruction of Mosquitos Ordinance were served during the year. Most of these notices were served in connection with work to be carried out on private property in the Kallang, Geylang, and Sungei Whampoe districts.

CONTROL OF DOMESTIC MOSQUITO BREEDING.

Mosquito larvae were found in 3,760 houses and compounds or 14.08 per cent of all houses inspected by sanitary inspectors.

112 complaints regarding nuisance from mosquitos were investigated and mosquito breeding was found on the complaint's premises in 57 instances and on the property of the neighbours in 40 instances.

I have the honour to be,

Sir,

Your obedient servant,

W. DAWSON,

Deputy Health Officer.

(62-D)

CHEMICAL LABORATORY,

Singapore, 6th February, 1937.

THE MUNICIPAL HEALTH OFFICER,

SINGAPORE.

Sir,

I have the honour to report on the work done in the Chemical Laboratory during 1936.

The total number of samples analysed during the year was 14,102 made up as follows:—

Public Water Supply	{	Routine samples from Singapore	
		Island	5,243
		Routine samples from Johore ..	2,573
Sewage Purification	{	Samples from Sewage Purification	
		Works and Special Samples ..	2,540
		Samples from House Installations ..	466
Foods, Drugs and Miscellaneous samples	{	From Health Department ..	1,979
		„ Engineering Department ..	347
		„ Electrical Department ..	506
		„ Water Department ..	41
		„ Gas Department ..	403
		„ Other Departments ..	4

This is a decrease of approximately 8 per cent on the number of samples examined during 1935, due to a reduction in the number of water samples from Singapore Island and routine sewage samples submitted.

MUNICIPAL WATER SUPPLY.

The sources of supply of raw water are Peirce and MacRitchie impounding reservoirs on Singapore Island and Sultan Ibrahim and Pontian impounding reservoirs in Johore.

The average daily consumption of water amounted to 17,020,000 gallons and approximately 58% of this was taken from the Johore supply in roughly equal amounts from Sultan Ibrahim (Pulai) and Pontian reservoirs. With the exception of about one quarter of one per cent of the total taken from MacRitchie reservoir, the remaining 42% was drawn from Peirce reservoir.

The chemical characteristics of these four raw waters are very similar, particularly those from Pontian, Pulau and Seletar (Peirce reservoir) which are in daily use. The soluble solids and solids in suspension

are about 30 and 3.5 parts per million respectively. The vegetable matter in solution is highest in Pontian and lowest in Peirce reservoirs (excluding MacRitchie reservoir) and the Pulai reservoir water has a higher iron content and is more coloured than the other two supplies. All these supplies were, as usual, found to be free from any harmful contamination.

The methods of treatment of the raw waters were practically the same as during previous years—at Pulai the raw water is subjected to aeration, chalk powder and alum solution are then added and the sediment formed is allowed to settle out in sedimentation tanks. After sedimentation the water is limed and filtered through rapid open filters and is finally chlorinated. Until November, 1936 the lime was added after filtration but the addition of lime before filtration has increased the length of filter runs and given a purer water. At Woodleigh the water, which has already been limed at Peirce reservoir outlet pipe, is passed through slow sand filters and finally chlorinated. A very interesting fact with these slow sand filters is that the film formed on the sand abstracts all the dissolved oxygen from the water passing through it but there is no similar action in the rapid sand filters at Pulai. At Pulai the majority of the organic matter in the raw water is abstracted in the sedimentation tank before reaching the filter bed whereas the majority of the organic matter at Woodleigh is deposited as a film on the filter bed. When the sedimentation tank at Woodleigh is in operation conditions should be similar to those at Pulai giving a more fully oxygenated tap water. The average dose of chlorine at Woodleigh was 0.37 parts per million (range from 0.11 to 0.69) and at Pulai 0.09 parts per million (range 0.07 to 0.16).

Regular analyses were done on tap water taken from three different parts of Singapore and the chemical quality of the water was excellent.

The samples received daily for analysis were drawn from every part of the purification system. The averages and ranges of analyses of the various raw waters are shown in detail in TABLE A and the complete analyses of two tap supplies are given in TABLE B, at the end of this report.

SEWAGES, EFFLUENTS ETC. FROM ALEXANDRA ROAD SEWAGE WORKS.

All the water borne sewage was again treated at the Purification Works at Alexandra Road, the average daily volume treated being 5,342,000 gallons, an increase of approximately 9.7 per cent on the average for 1935. The 'strength' of the sewage was not so high as during the previous year however, although approximately the same weight of crude night soil was washed into the water borne sewage at the pumping stations. It is hoped that this will be the last year of mixing crude night soil with water borne sewage and, with the results of special local experiments available, it should be much easier to purify each part separately giving infinitely less strain on every part of the purification system.

The crude sewage is passed through a detritus tank, which is designed to take out mineral matter only, through sedimentation tanks

which take out the settleable organic solids and finally through large filter beds. After sedimentation part of the sewage is treated in the bio-flocculation unit before passing to filter beds.

The Sedimentation Tanks consisting of a detritus tank, one Dorr tank of capacity 480,000 gallons and six 'upward flow' tanks of total capacity 300,000 gallons abstracted 57.5 per cent of the solid matter in the crude sewage, the monthly average values ranging from 53.5 per cent to 63.7 per cent. As the Dorr tank took 51.1 per cent of the total flow, the period of sedimentation in the Dorr and the 'upward flow' tanks is in the ratio of 1.53 to 1.0—that is, the sedimentation period in the Dorr tank is over 50% more than in the 'upward flow' tanks. Despite this longer period of sedimentation the Dorr tank abstracted a smaller percentage of solids than the 'upward flow' tanks (55.8% as against 59.5%). I understand that 'upward flow' tanks are to be constructed at the proposed new purification works at Paya Lebar.

The quality of the purified sewage from the percolating filter beds shows a slight improvement over the previous year, particularly from the twenty-one filter beds comprising Blocks C and D.

The Bio-flocculation unit was in operation practically the whole year and treated approximately 7.9 per cent of the total sewage effluent from the sedimentation tanks. The unit abstracted an average of 62.5 per cent of the solid matter in the sewage treated, the monthly averages abstracted ranging from 57.0 per cent to 65.8 per cent. As shown in TABLES C and D the sewage, after treatment in this unit, contained an average of 6.6 parts per 100,000 of solids in suspension (range from 2.4 to 11.8) and this liquid was filtered at a high rate through two filter beds.

Special experiments concerned with new methods of purification of sewage were continued along the lines mentioned in my previous report.

SEWAGE EFFLUENTS FROM HOUSE INSTALLATIONS.

The total number of purification plants at the end of the year was 128, including 16 Government, 7 Military and 3 Singapore Harbour Board which are not maintained by the Municipality. Of the 102 plants maintained by the Municipality approximately one-third are now built in the 'Imhoff' design and about one half have completely covered-in filter beds.

The average analysis of all the effluents examined during the year (over 400 analyses from 100 plants) gave the following excellent values:—

Parts per 100,000	Municipally—controlled House purification plants
Free and saline ammonia	0.89
Albuminoid ammonia	0.16
Oxygen absorbed in 4 hours	0.76
Suspended matter	1.7
Chlorides as chlorine	3.8
Nitrates	1.7

SAMPLES FROM THE HEALTH DEPARTMENT.

The total number of samples analysed was 1,979. These were obtained from various sources, including the Sanitary Inspectors of the Health Department and members of the laboratory staff. 1,061 samples were examined in connection with the Sale of Food and Drugs Ordinance and 918 came under miscellaneous headings, as follows:—

MISCELLANEOUS SAMPLES.

Well and pond waters	..	..	..	123
Water from abattoirs	..	..	..	104
Water from swimming pools		..	..	635
Other waters	..	..	..	42
Urine	..	..	..	4
Faeces	..	..	..	1
Gastric contents	..	..	..	2
Cooking pot	..	..	..	1
Tin Alloy	..	..	..	1
Fertiliser	..	..	..	1
Cigarettes	..	..	..	4
				—
				918
				—

The samples of swimming pool water taken regularly throughout the year from the Mount Emily, Y.M.C.A., Tanglin Club and Swimming Club pools. Most of the pond waters were in connection with anti-malarial work. The fertiliser was examined with regard to its suitability for use within a reservoir catchment area.

The cooking pot was a tinned copper vessel such as is used for making curry, and the alloy was the metal used for the internal coating, consisting mainly of lead and tin. Various samples of rice and curry were cooked in the pot, and the amounts of lead and copper absorbed were determined. It was found that with curry mixtures quite an appreciable amount of lead passed into the curry, in one case 18 parts per million, showing the unsuitability of this type of vessel for cooking purposes.

The following table gives the details of samples analysed under Ordinance No. 191 and the Regulations under the Ordinance:—

FOOD AND DRUGS SAMPLES.

SAMPLE	OFFICIAL		INFORMAL		Total
	Satis- factory	Unsatis- factory	Satis- factory	Unsatis- factory	
Milk and Milk Products:					
Fresh milk from itinerant hawkers	171	48	1	2	222
Fresh milk from retail shops and dairies	32	25	57
Boiled milk from eating houses..	1	4	..	..	5
Reconstituted milk	50	..	50
Tinned natural milk	3	..	3
Evaporated milk	10	..	10
Sweetened condensed milk	36	..	36
Milk powder	3	..	3
Infant food	1	..	1
Ice Cream	1	2	3
Butter	14	..	14
Ghee	1	1	2
Other Foods:					
Chocolate	1	..	1
Coffee mixture	1	..	1
Curry mixture	1	1	2
Essences	9	..	9
Margarine	1	..	8	2	11
Oil—coconut	7	..	7
fish (hardened)	1	..	1
vegetable	1	..	1
Peas—tinned	1	4	2	7
Rice	2	..	2
Sago flour	13	..	13
Sauces	22	2	24
Spinach, cooked	1	1
Sugar and Sugar solutions	7	..	7
Sweets	2	..	2
Vinegar	13	2	15
Beverages:					
Aerated water from fountains ..	72	18	290	94	474
Soda water from factories	33	..	33
Fruit syrup	3	..	3
Pineapple juice	1	..	1
Beer	2	..	2
Whisky	7	..	..	..	7
Brandy	5	..	..	..	5
Samsu	2	..	2
Rum	1	..	1
Gin	1	..	1
Drugs:					
Tincture of iodine	1	2	..	9	12
Quinine preparations	2	..	2
Glycerine	1	1
Gum dammar	1	..	1
Face powder	2	4	6
	258	73	582	148	1061

The proportion of adulterated milk samples from itinerant vendors was much smaller than last year, but the average extent of adulteration remained much the same. The following table summarises the results of analysis of these samples.

ANALYSES OF MILK SAMPLES BOUGHT FROM ITINERANT HAWKERS.

Number of samples	..	..	..	219
Deficient in non-fatty solids (i.e. with added water)	{	Number		44
		Percentage		20.1
		Range of deficiency	0.6% to	51.75%
		Average deficiency		11.95%
Deficient in fat	{	Number		10
		Percentage		4.55
		Range of deficiency	7.7% to	53.85%
		Average deficiency		18.3%

Six samples were deficient in both non-fatty solids and fat, making the total number of samples below standard 48, or 21.9%. This compares favourably with 31.0% last year, and approaches the best figure recorded (19.3% in 1934). Certificates for prosecution purposes were made out in 29 cases where the extent of deficiency excluded any possibility that it was due to abnormal milk.

It still appears to be the practice to add considerable amounts of water to the "boiled milk" supplied in eating houses. Out of five samples, four were found to contain added water in amounts ranging from 17% to 45%.

The samples of milk from the retail shops showed a seasonal variation, being consistently slightly below standard from May to August when they gradually recovered. Of the samples not up to standard, the deficiency in non-fatty solids ranged from 0.6% to 2.95% with an average of 1.25%, indicating a low grade of milk rather than the addition of water. The reconstituted milk was satisfactory throughout the year.

Other milk products were satisfactory on the whole, although several tins of condensed milk did not entirely conform to the labelling regulations. Samples sold as "ice-cream" and "ice-cream potong" were devoid of milk fat, although the Regulations state that "Ice-cream shall contain not less than ten parts per centum of milk-fat, present in the form of cream." Samples not containing cream should be sold as "Ices" and not as "ice-cream." One sample of ghee was found to be a ghee substitute containing no butter fat.

Tinned green peas containing copper in excess of two grains per pound (as crystalline copper sulphate) are now the exception rather than the rule, and of three unsatisfactory samples, the highest was 3.73 grains per pound. One curry mixture, the cooked spinach, two sauces and two vinegars showed slight metallic contamination with lead or copper, and two margarine samples contained an excess of water.

The very large number of aerated water samples was due to the introduction of a new type of machine. Since this machine at first gave

rise to the presence of lead in the product, the firm in question carried out a prolonged investigation with various modifications until a satisfactory arrangement was found, before any of the machines were put into use. No serious metallic contamination was found in the samples from the machines in use, but a few machines which gave unsatisfactory results became satisfactory again after thorough cleaning and flushing.

Samples of tincture of Iodine again gave evidence of careless dispensing. Only one was within the Pharmacopoeial limits, although four others were within ten per cent. of the correct figure. The rest ranged from 49.6% deficiency to 15.2% excess of iodine and 36.7% deficiency to 98.7% excess of potassium iodide. Three were made up with denatured spirit in place of alcohol. The glycerine contained slightly more water than is allowed in the Pharmacopoeia specification, and also a trace of iron. Four samples of face-powder were found to contain lead, but the stocks were very small and were seized.

Samples were analysed and reported on to other departments as shown in the following table:—

SAMPLES.				Water Dept.	Electrical Dept.	Engineers and Sewerage Dept.	Gas Dept.	TOTAL
Various waters	..	..		8	..	220	2	230
Various sewages	..	..		..	..	8	..	8
Coal	..	..	..	7	506	20	62	595
Coal gas	..	..	..	..	..	..	26	26
Sludge gas	..	..	..	..	..	26	..	26
Air	..	..	..	..	..	1	..	1
Gas dust	..	..	..	..	..	..	1	1
Coke	..	..	..	..	..	..	281	281
Oxide	..	..	..	..	..	..	27	27
Retort carbon	..	..	..	..	..	..	1	1
Sawdust mixtures	..	..	..	..	..	1	1	2
Tar	..	..	..	..	..	..	2	2
Fuel oil	..	..	..	..	..	7	..	7
Lubricating oil	..	..	..	..	..	48	..	48
Asphalt	..	..	..	..	..	4	..	4
Concrete and glazed pipes	..	..	..	..	..	7	..	7
Filler	..	..	..	..	..	1	..	1
Steel	..	..	..	..	..	1	..	1
Manure	..	..	..	..	..	2	..	2
Mud	..	..	..	..	..	1	..	1
Lime	..	..	..	18	..	..	..	18
Aluminium sulphate	..	..	..	7	..	..	..	7
Glass tank	..	..	..	1	..	..	..	1
				41	506	347	403	1,297

TOWN CLEANSING DEPARTMENT.

Pineapple liquor	..	..	..	1
Garbage	..	..	..	2

(69-D)

FIRE BRIGADE.

Canvas bag 1

Mr. J. F. Clark returned to duty from home leave in January. I have pleasure in recording my thanks to the laboratory staff for their willing co-operation in routine and research analyses during the year.

I have the honour to be,

Sir,

Your obedient servant,

R. E. WILLGRESS,
A.R.C.S., B.Sc., F.I.C.,
Municipal Analyst,
Singapore

TABLE A.

Averages and Ranges of Monthly Analyses of Singapore and Johore Raw Waters for 1936.

PARTS PER MILLION.	MacRitchie Reservoir		Pierce Reservoir		Sultan Ibrahim Reservoir		Pulai III Catchment		Pontian Ketchil Reservoir	
	Range.	Average.	Range.	Average.	Range.	Average.	Range.	Average.	Range.	Average.
Total solids dried at 180°C	27.6/58.0	40.0	26.8/40.8	33.1	29.6/38.4	35.3	23.4/38.4	32.9	33.6/54.8	42.1
Organic Matter	16.0/34.8	25.8	10.0/28.4	19.4	8.4/20.8	14.8	7.6/16.0	12.0	12.8/35.2	22.4
Mineral Matter	8.8/23.2	14.2	8.8/22.4	13.7	12.4/24.8	20.5	18.4/23.2	20.9	13.6/24.4	19.7
Total solids in suspension	1.6/20.8	5.1	1.6/9.2	3.5	1.6/5.6	3.5	0.8/10.0	3.6	1.2/16.4	4.7
Free and Saline Ammonia	absent/0.06	0.03	0.01/0.04	0.02	0.01/0.24	0.08	0.01/0.20	0.05	0.01/0.14	0.06
Albuminoid Ammonia	0.01/0.16	0.10	0.01/0.15	0.09	0.02/0.12	0.08	0.02/0.10	0.06	0.04/0.20	0.13
Nitrites as Nitrogen	.....	Absent	.....	Absent	.....	Absent	.....	Absent	.....	Absent
Nitrates as Nitrogen	.....	Absent	.....	Absent	.....	Absent	.....	Absent	.....	Absent
Oxygen absorbed in 3 mins.	0.140/0.450	0.317	0.210/0.445	0.359	0.140/0.480	0.259	0.100/0.460	0.235	0.223/0.733	0.440
Oxygen absorbed in 4 hours	0.580/1.420	0.939	0.970/1.370	1.088	0.368/0.970	0.750	0.228/1.150	0.682	0.900/2.156	1.453
Chlorides as Chlorine	0.5/2.0	1.4	0.5/2.0	1.0	1.0/3.0	1.6	1.0/4.0	1.8	0.5/3.0	1.3
Iron	0.80/1.70	1.13	0.30/0.70	0.49	0.25/2.60	1.11	0.25/0.80	0.52	0.50/1.00	0.68
Reaction—PH Value	6.3/6.9	6.6	6.2/7.2	6.5	6.0/5.9	6.6	6.0/6.6	6.3	6.6/7.3	6.9
Alkalinity (as CaCO ₃)	2.0/4.5	3.3	1.0/4.0	2.5	5.0/8.0	6.5	4.0/5.0	5.4	6.0/10.0	8.5
Carbon Dioxide	1.0/3.5	1.9	1.0/2.0	1.4	1.5/12.5	3.8	3.5/6.0	4.6	1.0/3.5	2.0
Colour in Lovibond 2 ft. Tintometer: 1. Yellow	4.5/14.0	8.3	3.0/10.0	4.9	2.0/17.0	7.1	2.0/3.7	2.8	3.6/8.0	5.6
2. Red	1.0/2.5	1.9	0.7/4.5	1.4	0.1/5.2	1.9	0.3/1.0	0.7	0.9/2.3	1.3
3. Blue	0.1/0.5	0.2	0.1/2.5	0.5	0.1/0.8	0.2	0.1/0.3	0.1	0.1/0.6	0.2

(70-D)

TABLE B.
Averages and Ranges of Monthly Analyses
During 1936 of Singapore Tap Supply.

PARTS PER MILLION.	HAVELOCK ROAD TAP SUPPLY.		COLEMAN STREET TAP SUPPLY.	
	Range.	Average	Range.	Average
Total Solids dried at 180°C	41.2/64.4	49.1	38.0/53.6	44.9
Organic Solids .	8.8/36.8	17.0	11.2/25.6	15.0
Mineral Matter ..	27.2/35.6	32.1	26.8/33.2	29.9
Total Solids in Suspension	Nil/19.6	3.7	Nil/8.8	2.2
Free and Saline Ammonia	0.01/0.08	0.03	0.01/0.04	0.02
Albuminoid Ammonia ..	0.01/0.09	0.05	0.02/0.08	0.04
Nitrites as Nitrogen .	...	Absent	...	Absent
Nitrates as Nitrogen ..	...	Absent	...	Absent
Oxygen absorbed in 3 mins.	0.061/0.156	0.110	0.070/0.172	0.111
Oxygen absorbed in 4 hours	0.176/0.390	0.280	0.192/0.390	0.273
Chlorides as Chlorine ..	0.5/2.0	1.4	0.5/2.0	1.3
Iron ..	0.07/0.25	0.14	0.05/0.20	0.11
Reaction—PH Value ..	6.7/7.5	7.2	6.8/7.4	7.2
Alkalinity (as CaCO ₃) ..	11.0/16.0	13.4	12.0/15.5	13.7
Carbon Dioxide ..	Nil/4.0	1.3	1.0/3.0	1.5
Colour in Lovibond 2 ft.				
Tintometer: 1. Yellow ..	0.6/1.3	0.9	0.5/1.3	0.9
2. Red ..	Nil/0.3	0.1	Nil/0.2	0.1
3. Blue ..	0.1/0.8	0.3	0.1/0.8	0.3

TABLE C.

Average of Daily Analyses of Crude Sewage and Effluents from Alexandra Road Works during 1936.

PARTS PER 100,000	AMMONIA		Oxygen absorbed in 4 hours	Suspended Matter	Nitrates as Nitrogen	Chlorides as Chlorine	Dissolved Oxygen Absorbed in 3 Days	P.H. Value
	Free	Albuminoid						
Crude Sewage	..	..	11.60	41.8	..	21	....	6.7
Dorr Tank Effluent	..	..	7.28	18.5	..	24	....	6.8
Upward Flow Tanks	..	..	6.78	16.9	..	28	....	6.9
Calculated Average Tank Effluent	..	..	7.00	17.7	..	26	....	6.9
Bio-Flocculation Effluent	..	..	3.83	6.6	..	26	....	7.2
Humus Tanks' Effluent:								
From Blocks A, B & E	0.93	0.17	1.36	2.1	1.4	27	2.10	..
From Blocks C & D	0.94	0.19	1.32	2.2	0.4	26	1.76	..

TABLE D.

Ranges of Daily Analyses of Crude Sewage and Effluents from Alexandra Road Works during 1936.

PARTS PER 100,000	AMMONIA		Oxygen absorbed in 4 hours	Suspended Matter	Nitrates as Nitrogen	Chlorides as Chlorine	Dissolved Oxygen absorbed in 3 days	P.H. Value
	Free	Albuminoid						
Crude Sewage	3.6/8.8	0.8/2.6	6.25/16.15	23.7/68.8	..	7/94	....	6.5/6.9
Detritus Tank Effluent (January/August)	..	..	..	25.8/59.0	..	..	....	..
Dorr Tank Effluent	3.6/9.6	0.6/2.4	4.45/9.70	11.3/30.0	..	11/105	....	6.7/7.1
Upward Flow Tanks	3.0/9.0	0.6/2.2	3.30/8.75	8.5/24.3	..	11/157	....	6.7/7.1
Bio-Flocculation Effluent	3.0/8.0	0.3/3.0	1.80/5.24	2.4/11.8	..	13/110	....	7.1/7.6
Humus Tanks' Effluent:								
From Blocks A, B & E	0.40/1.76	0.06/0.30	0.91/1.77	0.5/3.9	0.9/2.6	11/108	0.82/3.77	..
From Blocks C & D	0.44/1.68	0.04/0.32	0.76/2.00	0.8/4.3	0.1/0.7	12/118	0.71/3.00	..

BACTERIOLOGICAL LABORATORY,

SINGAPORE, *5th February, 1937.*

THE MUNICIPAL HEALTH OFFICER,
SINGAPORE.

Sir,

I have the honour to report on the work done in this department during the year 1936.

I. PUBLIC HEALTH EXAMINATIONS.

MALARIA.

Nine thousand, four hundred and seventy-seven blood films were received, 2,469 more than last year. During the last two months of the year the numbers dropped from an average of 829 up to October, to 688 in November and 499 in December. The largest number of films in any one month was in January when 1,145 were received. Malaria parasites were found in 1,768 films or 18.6 per cent. There were 627 subtertian infections, 1,136 benign tertian, 1 quartan and 4 mixed subtertian and benign tertian. It is probable that more mixed infections would have been found had it been possible to devote more time to individual films. Thirty-seven positive films came from the Johore Water Works, against 150 last year, 843 from the Health Department as against 651 last year and 888 from practitioners in town as compared with 932 last year. Of 96 films taken from bodies after death 16 were positive, 12 of which were subtertian, gametocytes (crescents) being present in 7, and 4 were benign tertian.

TUBERCULOSIS.

Human specimens:—1,605 specimens of sputum were examined in 300 of which the tubercle bacillus was demonstrated. In addition 6 specimens of faces, 2 of urine, 3 of pus, 23 of cerebro-spinal fluid, and 2 of blood were examined and the tubercle bacillus was demonstrated in 1 specimen of faeces and 2 of cerebro-spinal fluid. The positive result in the faeces was confirmed by animal inoculation. Both specimens of urine and 2 of pus were inoculated into guinea pigs but tubercular lesions were not produced.

Milk:—57 specimens were examined microscopically but acid fast bacilli were not found.

Animal specimens:—Acid fast organisms were found in one out of 4 specimens submitted viz. in the lung of a bullock. A great deal of work is to be done on tubercular like lesions in animals brought to slaughter if time permitted.

TYPHOID & PARATYPHOID FEVERS.

Three hundred and sixty four sera were tested against the Eberth. typhi and 122 gave a positive result, 312 tested against Sal. paratyphi (B. para A.) gave 4 positive results, and 312 tested against Sal. schottmulleri gave 25 positive results. Twelve specimens of blood, 67 of faces and 15 of urine were received and the Eberth. typhi was isolated from 3 specimens of urine.

Three samples of concentrated syrup and three samples of Chinese Chili Sauce were examined to see if they were contaminated with bacilli of the Enteric Group or were likely to aid the spread of Enteric Fever. As a result of experiment it was concluded that Eberth. typhi will not multiply in the concentrated syrup and if it gains access is quickly killed off, while the sauces were heavily contaminated with faecal organisms, and not very inhibitory to the growth of Eb. typhi.

DYSENTERY.

Amoebic:—1,338 specimens of faeces were examined in 39 of which the Ent. histolytica was found. The Ent. coli was found in 17, Iodamoeba. butschlii in 1 and Giardia intestinalis in 1.

Bacillary:—347 specimens were cultured and the B. dysenteriae of Flexner isolated from 2, and Hiss and Russel's bacillus from 1.

Cholera:—Three specimens were received all negative.

Plague:—No specimens were received.

Rats:—Four thousand and five rats were dissected and none of them found infected with plague. Five hundred and seventy-eight came from the Port Area or Ships, and 3,427 were caught in the town. The following tables show the species and distribution of the rats dissected.

Source	R. Decumanus		R. Rattus		R. Concolor		Musculus		Croci- dura	Total
	M	F	M	F	M	F	M	F		
Ports & Ships	64	90	185	218	7	8	—	1	5	578
Town ..	873	1,726	98	97	167	234	24	16	192	3,427
	937	1,816	283	315	174	242	24	17		
	2,753		598		416		41		197	4,005

Decumanus as in previous years continues to be the commonest rat trapped in the town, outnumbering rattus by 13 to 1, while in the Port it forms less than one third of the catch. Females again preponderate among the decumanus trapped, these being nearly two females to every male, whereas the sexes are about equally divided among the catch of rattus. Nineteen per cent of the females trapped in the town during the year were pregnant. The month with the lowest percentage was November with 12 per cent while the highest was February with 26 per cent. the next highest being September with 23.7 per cent. In the Port Area

the percentage of females pregnant was 18. The lowest month was July with 3.3 and the highest May with 36.3 and September with 33.3. Blood films from 429 rats were examined for *Trypanosoma lewisi* which was present in 64. The stomachs of 1,064 rats were examined for the presence of *Gongylonema gastrica* which was present in 632. Papillomatous tumors were found in two rats. The Weil Felix reaction was done on 25 rats and was negative.

FLEAS.

Three thousand nine hundred and ninety-one fleas were caught or 99 per hundred rats, a considerable increase on previous years. The index for the Port was 166 while in the town it was 88 more than double last years.

CEREBRO-SPINAL FEVER.

Sixty-three specimens of cerebro-spinal fluid were received and the Meningococcus was demonstrated in 26. From one specimen the pneumococcus was isolated and confirmed by inoculation into a mouse. Cultures of meningococci isolated were supplied to the College of Medicine for study.

DIPHTHERIA.

One thousand seven hundred and thirty-five specimens were examined from 282 of which the Coryn. diphtheriae was isolated. This considerable reduction on last year's numbers is largely due to a reduction in numbers of throat swabs sent from Middleton Hospital. In order to reduce the amount of work in the Laboratory, routine cultures from patients in that hospital are grown and examined there. One hundred and twenty-four swabs were received from the Registrars, all of which were negative.

LEPROSY.

Sixty six specimens were examined of which 23 were positive.

Miscellaneous specimens included:—

717	Specimens of urine for general examination (1).
120	„ pathological exudates.
718	„ pus for gonococci (138 positive).
5	„ urine for gonococci (5 positive).
2	„ prostatic smears (1 positive).
3,761	„ faeces for intestinal parasites (2).
16	„ serum for Trep. pallida (2 positive).
81	„ blood for differential count (3).
1,928	„ blood for Wassermann Reaction (345 positive).
1,843	„ blood for Kahn Reaction (261 positive).
496	„ blood for Weil Felix Reaction (3 positive).
429	„ blood for Tryp. lewisi (64 positive).
18	„ C. S. fluid for Wassermann Reaction (4 positive).
17	„ C. S. fluid for Kahn Reaction (negative).
16	„ pathological tissues.
1	„ sputum for pneumococci (negative).
5	„ swab for Cl. tetani (negative) (4).
1	„ powder for Cl. tetani (negative) (4).

1	Specimens of smear for B. anthracis (positive) (5).
5	„ blood from dogs for P. canis (negative).
4	„ vaccine.
1	„ antigen.
2	„ blood for culture.
2	„ scabs for fungi (negative).
1	„ blood for filaria (positive).
1	„ faeces for Johnes bacillus (positive).
1	„ C. S. fluid for colloidal gold test (6),
1	„ flour.
108	„ milk.
1	„ skin milk powder.
1	„ Ice Cream Mix.
1	„ Butter.
28	„ disinfectant (7).

(1) The large number of urines for general examination, which consisted mainly in testing for albumin, sugar, and microscopical examination was more than twice last year's number. Most were done as part of the medical examination of people on joining the service, or the Provident Fund. A large number came from the Lady Medical Officer, presumably from ante natal cases.

(2) Out of 3,761 specimens of faeces, 548 contained ankylostome ova, 480 had ascaris ova, 762 trichuris ova, and 25 oxyuris ova. Cercomonas was present in 3, tapeworm ova in 6 and cysts of Giardia intestinalis in 16.

(3) Differential blood counts. These were almost all from Middleton Hospital in cases of Measles and Rubella.

(4) These specimens came from cases of Tetanus neonatorum. All were negative on culture, and inoculation of the material and cultures into guinea pigs failed to produce tetanus.

(5) This specimen for anthrax came from the Municipal Veterinary Surgeon. No material for culture or inoculation was available but the microscopic appearance was typical.

(6) The test was not carried out, materials not being available.

(7) All these were examined in connection with tenders for supply of disinfectants.

Wassermann and Kahn Reactions. 1,928 specimens of blood and 18 of cerebro-spinal fluid were received and 18 remained over from 1935 while 8 were unexamined at the beginning of this year. Reports were issued on 1,956 specimens, an increase of 332 on last year. There were 333 positive results and 1,567 negative and 56 were doubtful being anti-complementary. One thousand, one hundred and twenty-six samples were received from the Lady Medical Officer, 733 from St. Andrew's Hospital, 19 from the Middleton Hospital, 34 from the Health Office, 5 from the Kwong Wai Siew Hospital and 39 from various other sources. The results are tabulated as follows:—

	Positive	Negative	Anticomple- mentary	Total
L.M.O. Adult Females ..	112	463	12	587
L.M.O. Adult Males ..	31	57	1	89
L.M.O. Infants ..	38	252	6	296
L.M.O. Blood from Umbili- cal Cord	26	90	26	142
L.M.O. Antenatal ..	3	9	—	12
St. Andrew's Hospital Ante Natal Clinic ..	27	308	—	335
St. Andrew's Hospital V. D. Clinic	41	85	2	128
St. Andrew's Hospital General Wards ..	29	221	5	255
St. Andrew's Hospital Cerebro-spinal fluid ..	3	15	—	15
Middleton Hospital ..	5	11	—	16
Middleton Hospital Cerebro-spinal fluid ..	—	1	2	3
Health Office ..	16	18	—	34
Kwong Wai Siew Hospital	1	2	2	5
Others	1	38	—	39
Total ..	333	1,567	56	1,956

A noteworthy feature of this table is the large number of bloods from the Infant Welfare Clinics (L.M.O.) particularly when taken from the umbilical cord after birth, which are anti-complementary, more than three times as many as from all the other sources put together. Of the 26 anticomplementary bloods from the cord 23 had a negative Kahn reaction and of the whole 56 anticomplementary bloods 34 had a negative Kahn and 18 a positive Kahn and if the 23 negative Kahn cord bloods are excluded the negative and positive Kahns in anticomplementary bloods are about equal, 18 to 16.

The Kahn Reaction was done on 1,814 specimens and agreed with Wassermann in 1687 or 93 per cent. almost the same percentage as last year. Two hundred and thirteen were positive and 1,474 negative. In 99 cases the Wassermann was positive and the Kahn negative and in 28 the Wassermann was negative and the Kahn positive. The percentage agreement is as follows:—

SOURCE	Agreed		Disagreed			
	W+	K+	W—	K—	W+	K+
L.M.O. Adult Females ..	14.8		78.6		4.7	1.9
L.M.O. Adult Males ..	28.4		63.4		6.8	1.2
L.M.O. Infants ..	8.4		87.6		4.0	—
L.M.O. Cord Blood ..	5.8		79.8		14.4	—
L.M.O. Antenatal ..	8.3		75.0		16.7	—
L.M.O. Total Specimens ..	13.5		79.5		5.8	1.2
St. Andrew's Hospital						
Ante Natal Clinic ..	5.0		91.6		2.9	0.5
St. Andrew's Hospital						
V. D. Clinic ..	19.8		62.9		12.0	5.3
St. Andrew's Hospital						
General ..	6.6		87.1		4.1	—
St. Andrew's Hospital						
Cerebro-spinal Fluids ..	—		78.6		21.4	—
Middleton Hospital ..	25.0		68.7		6.3	—
Middleton Hospital						
Cerebro-spinal Fluids ..	—		100.		—	—
Health Office ..	45.4		48.4		3.1	3.1
Kwong Wai Siew Hospital	—		66.6		—	33.3
Others ..	2.6		89.7		—	7.7

The total number of Public Health Specimens received was 28,418 and the number of examinations carried out was 34,141, once more a record for the laboratory.

They were derived from the following sources:—

Health Office	6,000	Total Practitioners Specimens. 8,089.
L.M.O. ..	..	..	1,969
Middleton Hospital ..	..	..	1,290
St. Andrew's Hospital ..	..	..	3,074
European Practitioners ..	..	..	4,371
Eurasian „	..	..	964
Chinese „	..	..	1,296
Malay „	..	..	599
Indian „	..	..	741
Japanese „	..	..	118
Rats „	4,005	
Fleas „	3,991	

II. WATER.

Seven thousand nine hundred and four samples from the Municipal supply were analysed. As in previous years the examination consisted of

- an estimation of the number of colonies per ml. developing on agar in 24 hours at 37°C.
- an estimation of the smallest quantity of water producing acid and gas in lactose, litmus, bile salt peptone water in 24 hours at 37°C.

The results obtained in both these examinations are averaged in the table below. The figures for lactose fermenters are expressed as percentage of samples. The results are pretty much the same as last

year and shew that a pure and safe water was supplied. The total colonies were higher in all parts of the system which may be connected with the low level of water in the reservoir during the greater part of the year.

Source.	Number of Organisms on Agar at 37°C in 24 hours	Lactose fermenters present in:—						
		—100	+100	+10	+1	+0.1	+0.01	+0.001
Sultan Ibrahim V.T. ..	91	13.6	86.4	28.1	3.8	—	—	—
„ „ C.W.T. ..	24	98.3	1.7	—	—	—	—	—
Seletar Dam ..	405	18.7	81.3	46.6	14.0	—	—	—
Pierce Res. V.T. ..	269	12.7	87.3	42.4	11.9	—	—	—
MacRitchie V.T. ..	216	—	100.0	66.9	11.0	—	—	—
Bukit Timah Raw..	98	66.7	33.3	11.1	—	—	—	—
Woodleigh C.I.Main ..	113	69.9	30.1	7.1	0.4	—	—	—
Pearl's Hill I Depth ..	61	56.2	43.8	6.4	—	—	—	—
„ „ II „ ..	69	58.9	41.1	5.1	—	—	—	—
Port Canning Reservoir ..	127	93.2	6.8	0.4	—	—	—	—
Tap (Office) ..	137	97.1	2.9	—	—	—	—	—
„ (Lorong Lalat) ..	164	80.8	19.2	3.0	—	—	—	—
„ (Havelock Road) ..	143	77.1	22.9	0.8	0.4	—	—	—
„ (Average of 3 taps) ..	148	85.1	14.9	1.3	0.2	—	—	—

On various occasions samples were taken at different points all along the pipe line from Gunong Pulai, and proved that the water was free from contamination at all points of the pipe line, and maintained its quality. No multiplication of algae took place in the pipe line.

Towards the end of the year leptospira were cultivated from the water in Pontian Kechil Reservoir. Attempts were made to infect guinea pigs with these leptospira, but no pathological effects were produced and the animals remained healthy for over two months.

The water in Mount Emily Swimming Pool was regularly examined throughout the year, and was found to be satisfactory. As in previous years the samples taken in the afternoon are much better than those taken during the early morning. The average results are as follows:—

Average results Mount Emily Swimming Pool.

SOURCE	Average number of colonies per ml.	Lactose fermenters (presumptive B. coli) present in:—					
		—100'	—100	—10	—1	—0.1	—0.01
Shallow End 7.30 a.m. ..	123	66.9	23.1	10.1	0.6	—	—
Deep End 7.30 a.m. ..	144	75.9	24.1	8.4	1.1	—	—
Shallow End 2 p.m. ..	27	99.4	0.6	—	—	—	—
Deep End 2 p.m. ..	34	97.8	2.2	—	—	—	—

One thousand and twenty-four samples were examined for algal growths. The method employed was to centrifuge 60 ml. of the water under examination and collect the algae deposited into 1 ml. which was then examined. In many cases bright green deposits of quite considerable depth were obtained in the tubes, and, when the algae of which these deposits were composed were counted in the haemocytometer cell, or Fuchs Rosenthal chamber, the figures arrived at seemed fantastic. As a result of these examinations some success has been obtained by the Water Engineer, in controlling the numbers of these organisms in the clear water tanks, at the different filtering plants, and consequently, in the tap water.

In May the water at Mount Emily Swimming Pool became greenish in colour due to a growth of *cosmarium*, which has been a source of trouble for some years now in the reservoirs, and *ankistrodesmus*, (or *raphidium*) the latter numbering 35,000 on 18th May and being an entirely new cause of trouble. By treatment with copper sulphate the numbers were reduced to 1,800 on 9th June and by the 16th they had disappeared and the water has since then remained free from them.

Pierce Reservoir was full of *cosmaria* during the first half of the year, and these organisms abounded in the main leading from the reservoir to Woodleigh where they passed through the filters and appeared in the clear water tank in numbers up to 40,000 per ml. so that the water in the tank had a greenish colour. *Staurostrum* appeared in numbers up to 2,600 but by treatment with copper sulphate, and the increasing rains at the end of the year and consequent filling of the reservoirs the numbers decreased to nil. Some very good experimental results were got at Bukit Timah filters where the numbers of algae were reduced from 5,760 to nil but just as the best results were being obtained the filters broke down.

III. SEWAGE.

Forty-six samples of chlorinated effluent from the Middleton Hospital were examined. For the first four months of the year bad counts were obtained but after April the highest average monthly count was 6,025. The average for the whole year was 13,400 colonies per ml. *B.coli* was not present in 100 ml. in 30.6 per cent of samples, and present in 100 ml. in 69.4 per cent. It was present in 10 ml. in 56.4 per cent, in 1 ml. in 47.7 per cent, in 0.1 ml. in 30.3 per cent, in 0.01 ml. in 23.8 per cent, in 0.001 ml. in 10.8 per cent and in 0.0001 ml. in 4.3 per cent of samples.

Twenty-four samples of wash water were examined for the Conservancy Department and were satisfactory.

Regular examinations of the heated digested sludge were made and in no case were active nematodes, or their larvae, found in the sludge that had passed through the heater even after keeping it in the laboratory for over a week. On the other hand the same sludge after being over a week on the drying beds was found to be full of active free living nematodes. These, however, pass the whole of their life history on the beds, and all the stages can be observed under the microscope. The sludge is probably infected with them by direct extension, and by birds and animals and insects, and they are perfectly safe.

(82-D)

IV. MORTUARY.

There were six postmortem examinations during the year the causes of deaths being

Diphtheria	..	..	..	3
Measles	..	..	..	2
Broncho pneumonia	..	..	..	1

I wish to record my thanks to my laboratory assistants, and peons for the way in which they have tackled a record number of specimens.

I have the honour to be,

Sir,

Your obedient servant,

COLIN C. B. GILMOUR,

M.A., M.B., Ch.B.,

MUNICIPAL BACTERIOLOGIST.

(83-D)

MUNICIPAL HEALTH OFFICE,

SINGAPORE, *6th February, 1937.*

THE MUNICIPAL HEALTH OFFICER,

SINGAPORE.

SIR,

I have the honour to submit the following report of the work done in the Supervision of Midwives and Infant Department during the year, 1936.

NEW BABIES.

During the year 17,418 new babies were taken on to the Clinic Registers. This is an increase of 1,403 over the number taken on the Clinic Registers in 1935, and represents 83.43% of the total births for the year.

CLINIC CONSULTATIONS.

The number of Clinic Consultations in 1936 amounted to 46,888 i.e. an increase of 6,360 over the number for 1935.

This figure is the highest since the year 1933, when it reached the record figure of 49,237.

In my Annual Reports for the years 1934 and 1935, I explained the reasons for the very marked decrease in the consultations (42,247 in 1934 and 40,528 in 1935), which were, that a greater number of mothers and babies were being sent either to Doctors, Hospitals, or Out Patient Dispensaries by us, or were going for treatment of their own accord.

This explanation still holds good, in that more and more cases are going to the proper quarters for treatment, and the actual increase this year can be assigned to other causes:—Firstly, the number of new babies taken on the Clinic Registers has increased from 16,015 in 1935 to 17,418 in 1936 and secondly there is ample proof that the mothers are steadily gaining confidence in the Clinics and are coming more regularly for advice in Mothercraft and Infant Care than in previous years, and these weekly and fortnightly visits have greatly augmented the numbers of consultations to be recorded.

It is very pleasing to me to have reports from the Hospitals that they are getting a great increase in the attendances of mothers and babies as Out Patients, and also, that although parents may still take their babies

for admission when they are almost moribund, there is a very definite increase in the number of babies who are taken by the parents on their own initiative in earlier stages of illness when a cure is possible.

The number of cases sent to Hospitals by the three Clinics has increased from 654 in 1935 to 1,071 in 1936, of which 348 were for In Patient treatment and 306 for Out Patient treatment in 1935, while the figures were 421 and 650 respectively, in 1936.

A large number of parents in these instances came to the Clinics for the sole purpose of obtaining letters from us for Hospital treatment, and in other cases, where Hospital treatment was advised, there were much fewer refusals.

There are still, of course, a fair number of babies brought to the Clinics suffering from minor ailments, such as slight coughs or "stomach trouble," which are cured by a short course of simple treatment and advice regarding feeding in the case of "stomach troubles," and we still continue to treat cases of gonorrhoeal conjunctivitis (which do not appear to be diminishing in number), and of chronic otorrhoea, because, as I explained in last year's Report, it is very difficult,—in fact almost impossible—to get parents to realise the gravity of these complaints and to take their babies anywhere for Out Patient treatment.

There is another disease, i.e. beri-beri, cases of which have always occurred year by year, but the increase in the numbers of cases of maternal and infantile beri-beri seen in the Clinics in 1936 is, to my mind, little short of alarming.

I have had similar reports from the local Hospitals of a very marked increase of such cases. I shall refer in greater detail to this feature of our work later in this Report.

INFANTILE MORTALITY.

It is extremely disappointing to have to report a rise in the Infantile Mortality Rate in 1936 to 191.6 per thousand compared with 171.2 per thousand in 1935 (which was the lowest on record).

An analysis of these figures by nationality shows that the Infantile Mortality Rate among the Chinese has risen from 172.3 per thousand in 1935 to 197.8 per thousand in 1936, while it has again fallen in the case of the Malays from 225.7 per thousand in 1935 to 219.9 per thousand in 1936, and in the case of the Indians from 136.0 per thousand in 1935 to 121 per thousand in 1936.

There is no great increase in any particular disease as a cause of death, but a uniform increase in the common causes i.e. beri-beri, diarrhoea and enteritis, and diseases of early infancy.

INFANT FEEDING.

This has been, as always, one of our biggest problems, but I can report a distinct improvement in the types and methods of feeding.

There is a marked increase in the breast fed babies both at Kreta Ayer and Prinsep Street Clinics, as in the previous year, while there is evidence to show that the mothers at the Joo Chiat Clinic (chiefly Malays) are beginning to realise the values of breast feeding, and I find that in the records of all three Clinics, there is an increase in the amount of complementary feeding, i.e. supplementing breast feeds with artificial feeds in cases of poor supply of breast milk, which is an improvement on the method of complete and sudden change from breast to bottle feeding, at the slightest reason, which has been so common in the past.

As in previous years, we have advised all expectant and nursing mothers as to suitable diet, and have provided them with galactogogues, tonics, etc: whenever necessary.

At the three Clinics 11,347 free tins of milk were distributed during the year; this is an increase of 4,539 over those given away in 1935, and can be explained, I think, by the increase in the number of babies on the books of the Clinics.

MALAY ATTENDANCES.

There has been a very obvious increase in the number of Malay mothers and babies attending the Clinics, the greatest increase being at Joo Chiat Clinic.

I am particularly gratified at the large numbers of Malay mothers attending Joo Chiat Clinic, not only coming with their babies, but also coming for ante-natal advice, and I feel that this great improvement is mainly due to the appointment of a qualified Malay Midwife to that Clinic early in the year.

The Malay Infantile Mortality Rate has again declined, as I stated above, and it is to be hoped that this decline will continue, and that it is in some measure due to the increased confidence that the Malay mothers are showing in our work amongst them.

HEALTH VISITORS.

In my Report for 1935, I said that, owing to the very large increase in house-to-house visits, necessitated by the greater numbers of babies on the Clinic Registers, it had been very reluctantly decided to cut out one visit per baby in 1936.

The number of visits paid by the Health Visitors in 1936 was 117, 064, but, in spite of this decrease of 6,652 for the year, owing to the above mentioned cancelling of one visit per baby, the staff have been working to the limit of their capacity, and, if the births continue to increase as they have done in the past few years, I foresee a return to a state of affairs similar to that in 1934, just prior to the decision to cancel one visit per baby.

SUPERVISION OF MIDWIVES.

The increase in births reported to the three Clinics i.e. 18,439 compared to 17,265 in 1935, has given the District Staff Nurses an extremely busy year.

The total number of visits paid by the District Staff in 1936 was 26,062, which was an increase of 1,291 over those for the preceding year.

There were 18,304 first visits paid to newly confined mothers, 3,751 were re-visits to 1,183 ailing mothers, while 4,107 visits were paid seeking 1,883 wrong addresses, and in addition to these wrong addresses, 999 cases could not be traced.

The percentage of sick mothers in 1936 was 6.46%, which is slightly lower than the figure 6.6% for 1935.

In 1935 there were 46 maternal deaths among the confinements reported to the three Clinics, which is 0.0268 per thousand, and in the year 1936 there were 50 deaths, which is 0.0273 per thousand.

The number of removals during the first ten days after the birth of the child was 131 compared to 136 in 1935.

Of the 18,304 mothers visited, 14,614 or 79.8% were found to be living in cubicles or single rooms.

There were 18,439 births reported to the Clinics (these included 135 pairs of twins) which represented 88.32% of all births registered in the Municipality compared with 87.4% in 1935.

Of these 18,439 births reported to the Clinics, 17,566 or 95.2% of the babies were seen by the District Staff Nurses, compared with 95% in 1935.

I mentioned in my Annual Report for 1935 that I always feel concerned over the number of mothers confined without any skilled attention and remarked that, despite the increased number of births, the numbers of cases were showing a slight decrease. The figures for 1936 show again a small decrease, viz: out of 18,304 mothers confined, there were 4,154 or 22.69% who had no skilled attention, compared, with 24.41% in 1934 and 23.33% in 1935.

I admit that the decreases are small, but I feel that it is an indication that our advice to pregnant mothers either to go to Hospital or to get the attention of a Registered Midwife is bearing fruit, and the figures for the cases confined in Hospitals or attended by Private Doctors or by Registered Midwives bear this out.

PUERPERAL SEPSIS.

The figures for the incidence of puerperal sepsis show that there were 26 cases or 0.0125 per thousand notified in 1936, compared with 0.0092 per thousand in 1934 and 0.0107 per thousand in 1935.

REGISTERED MIDWIVES.

In 1936, 3,896 mothers whose confinements were reported to the Clinics, had been confined in Hospitals, or attended by Private Doctors, or "A Class" Registered Midwives—of these cases, by far the greatest number were confined in Hospitals.

“ B Class ” Registered Midwives attended 9,259 cases i.e. 510 more than in 1935, while “ C Class ” Registered Midwives attended 995 cases, or 950 less than in 1935.

The increase in cases attended by “ B Class ” Registered Midwives is not as great as it was in 1934 (801), but shows good progress, while the big decrease in cases attended by “ C Class ” Registered Midwives is noticeable.

MUNICIPAL MIDWIVES.

In my Report for 1935, I stated that the work of the Municipal Midwives had reached such proportions that it had been found necessary to appoint a Midwife to Joo Chiat Clinic (which had been previously included in the work of the Prinsep Street Clinic Midwife).

The increase in this branch of our work is perhaps one of the most gratifying, and is mainly due to the increase in the work done by the Joo Chiat Clinic Malay Midwife, who commenced her duties in February 1936.

The total number of poor cases attended by the three Clinic Midwives in 1936 was 1,364, which is 355 more than in 1935 and 538 more than in 1934 and they paid 7,282 visits, an increase of 1,468 for 1935 and 2,554 more than in 1934.

The types of cases were as follows:—

Confinements 512, which is an increase of 168 for the year; post-natal cases 519, which is an increase of 32 for the year, and ante-natal cases 286 for the year.

These records are very good in my opinion, coupled with the increase in the number of mothers confined in Hospitals, or attended by Doctors or Registered practising Midwives, as it shows that there is a growing tendency for these mothers to appreciate the advantages of obtaining skilled attention at their confinements and during the puerperium.

The ante-natal cases seen by the Municipal Midwives have increased from 48 in 1934 to 182 in 1935 and to 286 in 1936, the majority being at Joo Chiat Clinic.

These ante-natal cases have, up to the present, been included in the Clinic Midwives returns, as they have seen the women in the Clinics and, in a few cases, have visited them in their homes, but it is felt that in the future, it will be best to keep separate records of those attending the Clinics, who will be seen by the Clinic Staff, and of those actually visited in their own homes by the Clinic Midwives.

This increase in ante-natal cases is welcomed by me, and is something for which I have hoped during the last three years, and I look forward to being able to report yet more of these cases in the coming year, as I consider that it is only through getting the mothers to come to the Clinics for ante-natal advice, that we can attempt to combat the scourges of maternal and infantile syphilis and beri-beri.

In view of the increase in the work of the three Municipal Clinic Midwives, a fourth Midwife has just been appointed to ease their duties.

MUNICIPAL "PANEL" DOCTORS.

There were 48 cases of difficult confinement among poor mothers, to whom the Municipal "Panel" Doctors were called to give their advice and treatment during 1936, compared with 30 cases in 1935.

In this connection the Municipal Midwives transferred 16 cases of complicated labour to Hospitals during the year, i.e. 1 more case than in 1935.

TETANUS NEONATORUM.

There were 108 cases of Tetanus Neonatorum reported to me from Hospitals during the year, which is an increase of 57 over those in 1935 and represents a total of 2.201 per thousand births.

All these cases were investigated, as in previous years, and were cases of "unskilled attention at labour."

VENEREAL DISEASES.

I can see no decrease in the number of cases of syphilis in mothers and babies attending the three Clinics during 1936.

It is still as difficult as ever to get these mothers to go for treatment either before or after the birth of their babies, and in only 1% or less of these cases, do they have a full course of treatment.

I cannot stress my anxiety too much over this problem, and my desire to get more ante-natal cases (and early in pregnancy not at nearly full term, as so often happens) when anti-syphilitic treatment will ensure that a large percentage will be born free of the taint.

An intensive study of all cases seen at the three Clinics and specially recorded during the five years 1931 to 1935 inclusive with notes as to the present condition of the parents and children, has been made for the past eighteen months and the analysis of this study is likely to give some illuminating results.

A selected number of these cases are still being "followed up" and subsequent pregnancies and the condition of the mothers and babies born is being recorded.

Gonorrhoeal Conjunctivitis is as prevalent as ever, and these cases have been treated in the Clinics with success, as in previous years.

DIET DEFICIENCIES.

I have, in previous Annual Reports, remarked upon the large numbers of cases of avitaminosis, particularly of vitamin B. i.e. beri-beri, among the mothers and babies on our Registers, and under the heading "Clinic Consultations" in this Report, I have referred to the situation as "little short of alarming."

I cannot emphasise too strongly the concern I feel over this aspect of our work.

It is a daily occurrence at all three Clinics to have not one but several cases of beri-beri in both mothers and babies.

Some of these cases are severe, and only urgent Hospital treatment can save them—particularly in the babies, where acute cardiac symptoms may easily terminate in sudden death.

Less severe forms we treat in the Clinics with special preparations rich in vitamin B, at the same time urging the parents to our utmost to take our advice regarding suitable ante-natal and post-natal diet.

Our efforts in this direction are, unfortunately, only too often listened to, but not put into practice, because of the deep-rooted customs which these mothers believe in and will not give up.

We are having a real fight against this menace of ante-natal and post-natal beri-beri, and I can truly say that we could easily fill a Hospital ward every day, with cases of this disease, seen by us in the Clinics; if the mothers and babies could go, and there were the accommodation for them.

I had hoped that, with improving economic conditions these mothers would be able to afford better and more nourishing food, but, as far as I can see, the more money the parents earn, the more polished rice they buy.

It is an extremely significant fact that all infantile beri-beri deaths recorded in the year 1936 were among the Chinese, i.e. 149, compared with 57 in 1935. This number of deaths recorded is small, and I feel justified in giving my opinion, in view of the great numbers of these cases seen by me in the Clinics every day, that a good many of the deaths reported under the headings “convulsions” or “diseases of early infancy” are, in reality due to infantile beri-beri.

Anaemia and calcium deficiency in pregnancy are still much in evidence, and here again, the lack of proper food can be taken as the primary causative factor, and we advise the mothers as to the proper diet and give them the necessary preparations to make up for their lack of iron and calcium in their diets.

I can only repeat that, in my opinion, there is no other way to attack this serious problem of diet deficiency than through early and adequate ante-natal advice and treatment.

CHARITABLE ORGANISATIONS.

I would like to record my deep appreciation of all the practical help extended to the many necessitous cases I have reported to the Salvation Army and the Jubilee Fund during the past year.

STAFF CHANGES.

Dr. Mary Tan was appointed Assistant Lady Medical Officer to this Department at the beginning of the year.

(90-D)

Staff Nurse Mrs. Elsie Quah resigned in November, and Health Visitor Mrs. Yeo Cheng Gake was promoted to take her place.

Nurse Ngieng Geok Choo was appointed to fill the vacancy thus caused.

I have the honour to be,

Sir,

Your obedient servant,

MURIEL G. E. CLARK,

Lady Medical Officer.

(91-D)

MIDDLETON HOSPITAL,

SINGAPORE, 19th January, 1937.

THE MUNICIPAL HEALTH OFFICER,

SINGAPORE.

Sir,

I have the honour to present the report of the Middleton Hospital for the year 1936.

The following table summaries the cases treated during the year.

Disease	Remaining	Admitted	Discharged	Died	Remaining
Smallpox	—	1	1	—	—
Cholera	—	—	—	—	—
Plague	—	—	—	—	—
Chickenpox ..	7	835	832	—	10
Measles	2	181	172	11	—
Diphtheria ..	3	146	99	42	8
Cerebro-Spinal Fever..	1	19	4	16	—
Erysipelas	1	3	3	1	—
Whooping Cough ..	—	2	1	—	1
Mumps	1	339	326	—	14
Under Observation ..	1	35	34	—	2
Rubella	—	24	23	—	1
Tuberculosis	—	3	3	—	—
Enteric Fever ..	—	1	1	—	—
Other Diseases ..	—	81	73	8	—
Total ..	16	1670	1572	78	36

Although there was no outbreak of dangerous infectious disease during the year, the number of patients admitted, 1,670, again constitutes a record. Exactly half of the patients admitted suffered from Chickenpox and almost one fifth from Mumps.

Smallpox:—Only one case was admitted and as soon as diagnosed was transferred to St. John's Island quarantine station.

Cholera & Plague:—No cases occurred during the year.

Diphtheria:—Once again this was the most serious disease treated during the year. One hundred and forty-nine cases were treated of whom 146 were admitted during the year. There were 42 deaths from this disease a total mortality of 28.2 per cent. Twenty-one of these deaths, occurred within 24 hours of admission, 12 of them in less than 12 hours. If these moribund cases are deducted the death rate was 14.1 per cent. from this disease. Thirty-nine cases suffered from laryngeal, tracheal or bronchial diphtheria of whom 27 required tracheotomy and 16 of those died. Ten patients were children under 1 year of whom 8 died, 64 were between 1 and 5 years of whom 24 died, 37 were between 5 and 10 years of whom 4 died, 20 were between 10 and 20 years of whom 3 died and 15 were above 20 of whom 1 died. Half the cases and more than two thirds of the deaths were children under 5 years of age. As in previous years many children are brought late in the disease, and sometimes suspicion is aroused that a desire to be rid of responsibility for burial is one reason for bringing the child to hospital. Twenty-seven of the fatal cases gave histories of being ill for more than 6 days, but as 8 out of the 15 who died with a history of less than 6 days illness, died within 24 hours of admission it is probable that the 2 to 3 days history means that it was for that length of time that the illness was desperate. Sudden cardiac failure accounted for 10 deaths and was not prevented by doses of serum up to 150,000 units. The nationalities admitted for this disease were Europeans 11, Eurasians 4, Malays 1, Tamils 2, Chinese 127 and others 1. All the deaths occurred amongst Chinese. The total amount of serum used was 3,321,000 units averaging 22,700 units per case. As diphtheria can be prevented by immunizing the individual, best and most easily done, between the ages of one and five years I would again suggest that immunization should be made available for all babies whose parents desire it before leaving the care of the Infant Welfare Centres.

Chickenpox:—Of 835 admissions 154 were Municipal employees, 120 were Government employees, 168 were school children and 393 individuals not coming under any of these categories.

Mumps:—Two hundred and twenty nine out of 339 admissions were Municipal employees, and 32, Government servants, chiefly police constables. Twenty were school children.

Measles:—One hundred and eighty-three cases were treated with 11 deaths, of which 6 were due to Broncho-pneumonia, 1 to Bronchitis and Enteritis, 1 to Meningitis following on Otitis media, 1 to Convulsions and 2 to Carbuncles.

Other diseases:—Eighty-one persons suspected of suffering from one or other of the notifiable infectious diseases were admitted of whom 8 died. The causes of death were Broncho-pneumonia 4, Pneumonia 1, Thrush 1, Cellulitis 1, and Osteomyelitis of the Jaw 1. Six of these were sent in as laryngeal diphtheria on account of cyanosis and dyspnoea. The other cases were transferred to other hospitals or discharged.

Nationalities:—The nationalities, and number of days spent in hospital are summarised in the following table.

NATIONALITY.	Remaining from 1935.		Admitted 1936.	
	No.	Days.	No.	<i>days</i> 09
Europeans	2	7	58	Days ⁶⁰
Eurasians	—	—	111	1444
Chinese	7	117	451	980
Indians	6	28	933	6523
Malays	1	1	113	11748
Jews	—	—	4	1483
	16	153	1670	22238

The number of children admitted was 601 an increase of 207 on last year, and the number of days spent in hospital 7,171 more than last year.

The table showing admissions during the last ten years is appended.

DISEASE	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Cholera ..	20	4	—	—	—	—	—	—	—	—
Smallpox ..	16	8	9	—	3	7	1	1	61	1
Plague ..	2	3	—	—	—	—	1	—	—	—
Chickenpox ..	180	324	553	334	196	491	252	398	538	835
Diphtheria ..	16	42	38	35	46	90	159	152	115	146
Cerebro-Spinal Fever ..	14	13	3	17	6	6	3	7	11	19
Measles ..	69	94	42	60	58	7	110	58	144	181
Erysipelas ..	3	6	1	7	1	—	2	2	4	3
Mumps ..	79	48	66	10	17	22	178	149	61	338
Whooping Cough ..	4	8	1	14	20	3	8	6	3	2
Enteric Fever ..	1	—	—	1	1	1	—	—	—	1
Tuberculosis ..	—	1	1	1	1	2	3	4	—	3
Rubella ..	18	7	6	5	14	4	1	40	29	24
Scarlet Fever ..	—	3	6	—	—	—	—	2	1	—
Typhus Fever ..	—	1	—	—	—	—	—	1	—	—
Puerperal Fever ..	1	—	—	1	2	—	—	—	—	—
Contacts ..	42	45	17	48	22	36	357	37	90	36
Other Diseases ..	52	63	63	44	44	55	85	73	94	81
	517	670	806	577	431	724	1160	930	1151	1670

(94-D)

I would like to record my thanks to Prof. R. B. Hawes for his help and advice, and to Prof. B. M. Johns and Dr. Balhatchet for performing tonsillectomies necessary to cut short the stay in hospital of diphtheria patients threatening to become chronic carriers.

I have the honour to be,

Sir,

Your obedient servant,

COLIN C. B. GILMOUR,

M.A., M.B., Ch.B.,

Medical Superintendent.

(95-D)

MUNICIPAL HEALTH OFFICE,

SINGAPORE, *4th March, 1937.*

THE MUNICIPAL HEALTH OFFICER,

SINGAPORE.

SIR,

I have the honour to submit my seventeenth Annual Report on the Municipal Markets, their repair and upkeep and the inspection of the foodstuffs sold in them and in the shops and stores of the city.

MUNICIPAL MARKETS.

No new municipal markets have been built during the year but licensed meat shops have so developed as to become to all intents and purposes small markets and the centres for congregations of hawkers who clutter the 5' way and cause much obstruction and litter.

The Annual clean out took place on Chinese New Year's day and for the larger and loftier markets hoses and couplings were kindly lent by the Superintendent of the Fire Brigade. About the end of November a strike among the Tamil coolies took place. Our coolies who up to then had not complained joined in on the 1st December and for nearly a fortnight casual labour was hired to remove the garbage. Our coolies, however, worked at nights in shifts, so as to avoid the pickets. A special report was made to you at the time.

The Markets are in a good state of repair and as will be seen by returns in an apparently flourishing condition as regards trade, Joo Chiat seemingly being the only laggard.

REPAIRS.

Clyde Terrace Market. The whole of the underside of the roof of the Dry Goods, pork, beef and mutton sections was painted white making the market much brighter.

The expanded fence of the auction area was repaired, also the poultry shed roof and floors.

A wooden platform to the coral bund was erected by the P.W.D. to facilitate the landing of fish during reclamation work.

Ellenborough Market. Floor of main market was relaid. Four concrete dry goods stalls repaired.

All meat tables covered with aluminium instead of zinc.

Telok Ayer Market. New awnings and chicks in poultry section were supplied.

The market office was painted inside and out and the steps and floor of the compound graded and relaid.

(96-D)

Orchard Road Market. The roof showed signs of white ants and new battens were inserted.

All Markets. Minor repairs to drains, gates, and railings were carried out on request.

Pillars to prevent entrance of tricycles were put in all entrances where thought necessary.

UNSOUND FOODSTUFFS.

96,168 catties or equivalently 57 $\frac{1}{4}$ tons of unsound foodstuffs were taken by our coolies to the incinerator for destruction. This includes about 14 tons of bad fish. All garbage is sprayed with disinfectant before being sent to prevent pilfering on the way.

PRICES AND QUANTITIES OF FOODSTUFFS.

In all but shellfish and bean cakes the quantities show an appreciable increase. Fish for instance 450,000 catties more than last year while beef shows a 20% increase and mutton a 16% increase. In the case of mutton at Orchard Road Market where there is only one stall now over 42,000 catties were sold in comparison with approximately 27,000 catties last year when three stalls were in occupation for a large part of the year.

The approximate value of recorded foodstuffs increased by \$182,000 and as by the returns below average prices did not greatly rise it would seem that a meed of prosperity returned to the buying public.

TABLE (A)

ARTICLE	Per	1924 Av. Price	1928 Av. Price	1932 Av. Price	1933 Av. Price	1934 Av. Price	1935 Av. Price	1936 Av. Price
		\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Beef ..	Kati	.41	.53	.35	.30	.29	.36	.33
Mutton ..	lb.	.62	.55	.36	.33	.31	.31	.35
Pork ..	Kati	.62	.60	.47	.42	.41	.43	.42
Tea ..	"	.92 pkt.	.98 pkt.	.84 pkt.	.83	.85	.80 pkt. (1 lb.)	.78
Coffee beans	"	.47	.67	.39	.40	.40	.40	.39
Sugar ..	"	.14	.09	.05	.05	.05	.04	.04
Salt ..	"	.03	.04	.03	.03	.02	.02	.02
Potatoes ..	"	.12	.11	.07	.06	.05	.06	.05
Yam ..	"	.06	.07	.04	.03	.03	.03	.03
Onions ..	"	.09	.11	.06	.05	.05	.05	.06
Ducks ..	Dozen	9.60	10.20	6.00	6.00	5.40	5.07	5.04
Pigeons ..	Pair	1.10	1.20	.80	.78	.70	.70	.65
Eggs (hens)	Dozen	.52	.55	.39	.31	.30	.25	.25
Capons ..	Kati	.73	.91	—	—	—	.53	.50
Fowls ..	Each	.53	1.85	.70	.60	.50	.48	.45
Rice ..	Gantang	.57	.45	.28	.25	.23	.30	.28

REVENUE (TABLE B).

MARKET	1930	1931	1932	1933	1934	1935	1936
Clyde Terrace ..	\$163,492.65	\$135,399.03	\$120,583.78	\$107,441.29	\$119,857.82	\$132,693.97	\$134,847.44
Ellenborough .	108,947.37	93,524.63	80,176.91	69,124.92	71,709.22	75,344.17	76,319.98
Telok Ayer .	29,290.31	27,250.93	23,210.57	20,167.00	19,337.50	19,025.00	19,219.50
Orchard Road .	13,927.50	15,962.00	14,814.50	14,086.50	14,105.00	14,005.00	14,421.50
Kandang Kerbau .	18,892.00	18,811.50	18,617.00	17,302.00	17,645.00	17,948.00	18,407.00
Grange Road .	2,628.00	2,247.00	1,850.00	1,662.00	1,790.00	1,818.00	2,076.50
Geylang ..	3,919.00	577.00	abolished	abolished	abolished	abolished	—
Sims Avenue .	1,345.00	4,034.00	4,288.50	4,103.50	3,742.50	3,630.00	3,663.00
Maxwell .	449.00	9,152.00	8,280.00	7,259.50	7,407.50	8,340.00	9,116.00
Peoples Park ..	14,176.00	13,254.50	12,936.00	9,752.50	9,203.50	9,569.00	8,834.00
Joo Chiat ..	3,350.00	3,178.00	1,288.00	545.50	383.75	297.25	187.50
	\$360,416.83	\$323,390.59	\$286,045.76	\$251,444.71	\$264,181.79	\$283,165.39	\$287,091.92

5% Commission on Fresh Fish Sales (Table C).

MARKET	1929	1930	1931	1932	1933	1934	1935	1936
Clyde Terrace ..	\$120,051.98	\$110,660.65	\$ 84,582.03	\$ 73,861.78	\$65,787.79	\$78,719.82	\$91,445.97	\$94,053.94
Ellenborough ..	71,866.59	64,071.37	50,016.13	40,069.91	32,919.92	35,547.72	38,827.17	39,142.98
Telok Ayer ..	1,903.30	1,462.31	1,037.93	490.07	abolished	Nil	Nil	—
	\$193,821.87	\$176,194.33	\$135,636.09	\$114,421.76	\$98,707.71	\$114,267.54	\$130,273.14	\$133,196.92

An increase of revenue of nearly \$4,000 or about 2% on last year figures is mostly due to the 5% commission on wet fish sales and is apparently accounted for by lower prices obtaining though a large quantity of fish passed through.

STAFF.

Market Keeper Perreau was granted leave prior to retirement on reaching 55 years in December but has been taken on again after leave expires on a month to month basis.

85 coolies reported sick during the year and were treated by Medical Officer in charge Staff.

RETURNS.

The following returns are supplied as shown:—

Weekly. Price lists to Press, Registrar General of Statistics, etc.

(98-D)

Monthly. Total catch of fish to Fisheries Officer. Average monthly prices to Registrar General of Statistics.

Quarterly. Stock of foodstuffs in markets on 1st day of each quarter at 7 a.m. to Registrar General of Statistics.

Lectures to 5th year Medical Students and also to students for the Royal Sanitary Institute certificate are given as requested. Many enquiries and also complaints are dealt with on the spot and call for no special comment.

TOWN.

16,163 items of all kinds of unsound foodstuffs were destroyed during the year. It might be pointed out that an item may be a case, a carcase or a tin; and a tin might mean a tin of ham (12 lbs.) or a tin of peas but it would mean a lot of unnecessary work to detail every item under a separate heading. The total weight represented, however, is over a hundred tons.

Samples. 544 official and informal samples were taken and sent to the Municipal Analyst, particulars of which will be found in his report.

Survey of all manner of foodstuffs were made during the period under review and in all cases my recommendations were followed.

I attach returns showing the approximate amount of foodstuffs passing through the principal markets with their estimated value, the quantity of unsound foodstuffs destroyed and a summary of vacant stalls as on 31st December, 1936.

I have the honour to be,

Sir,

Your obedient servant,

M. N. MACMAHON,

Cert. R. San. Inst.,

Food and Market Inspector.

SUMMARY OF VACANT STALLS END OF DECEMBER, 1936.

(99-D)

	Clyde Terrace. No.	Ellen- borough. No.	Telok Ayer. No.	Orchard Road. No.	Kandang Kerbau. No.	Maxwell Road No.	Joo Chiat. Road No.	Grange Road. No.	Peoples Park. No.	Sims Avenue. No.
Dry Goods ..	1	..	1	..	..	10	..	1	..	..
Beef ..	9	..	..	..	..	4	5	6	..	1
Salted Vegetables ..	..	..	..	..	..	1	2	..	..	2
Mutton ..	1	..	..	2	..	..	5	..	..	1
Pork ..	6	1	6	2	..	5	10	1	2	4
Curry Stuff ..	..	..	..	..	..	..	2	..	..	..
Bean Cakes ..	..	..	1	3	..	4	4	..	..	1
Poultry ..	13	21	2	1	..	13	..	..	2	4
Vegetables and Fruits ..	23	13	27	6	8	28	19	7	..	20
Eggs ..	..	..	1	2	..	1	2	..	..	1
Money Changer ..	1	..	..	..	..	1	..	..	..	..
Eating ..	..	..	5	..	..	..	..	..	..	..
Fish ..	8	16	1	13	..	29	40	7	5	3
Shell Fish ..	..	..	..	..	..	..	..	..	..	..
Hawkers ..	..	9	..	..	..	..	1	..	..	..
Provisions ..	..	..	..	1	..	..	..	1	..	..
Dressed Ducks ..	..	..	..	..	..	3	..	..	..	..
TOTAL ..	62	60	44	30	8	99	90	23	9	37

M. N. MACMAHON,
Cert. R. San. Inst.,
Food and Market Inspector.

RETURN OF SOME OF THE FOODSTUFFS PASSING THROUGH MARKETS FOR THE YEAR 1936.

Market.	Wetfish ctts.	Boiled Fish ctts.	Shell Fish ctts.	Beef ctts.	Mutton ctts.	Pork ctts.	HEADS					Bean Cakes ctts.	Bean Sprouts ctts.	Approx. Value \$ cts.
							Fowls	Capons	Geese	Ducks.	Pigeons.	Turkeys		
Clyde Terrace ..	17,068,064	43,030	137,780	260,735	228,040	465,255	47,993	..	1,033	47,455	7,648	..	11,690	2,314,229 78
Ellenborough ..	4,444,879	..	153,405	11,955	..	840,949	55,481	1,558	3,940	88,149	1,530	..	166,452	1,173,475 74
Telok Ayer ..	43,561	..	40,120	41,971	70,426	238,163	28,880	..	698	10,283	2,469	101	..	175,858 97
Kandang Kerbau ..	995 490	35,338	..	162,741	207,972	460,070	53,063	..	..	9,778	..	..	45,615	570,546 55
Orchard Road ..	712,855	45,295	..	270,798	42,529	328,802	44,345	..	..	5,368	3,907	..	39,584	410,710 25
Peoples Park ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maxwell Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Grange Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sims Avenue ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Joo Chiat Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	23,264,849	123,663	231,305	748,200	548,967	2,333,239	229,762	1,558	5,671	161,033	15,554	101	263,341	\$4,644,521 29

(100-D)

M. N. MACMAHON,
 Cert. R. San. Inst.,
 Food and Market Inspector.

UNSOOUND FOODSTUFFS DESTROYED DURING 1936.

Market.	Wetfish ctts.	Saitfish ctts.	Beef ctts.	Mutton ctts.	Pork ctts.	Vegetables ctts.	Fruits ctts.	Tinned Goods.		Bottles preserves No.	Eggs No.	Miscella- neous	Total Items.
								Cases.	Tins.				
Clyde Terrace ..	15,949	86	..	..	..	1,669	40	..	47	..	..	..	..
Ellenborough ..	4,610	316	..	..	..	277	48	..	..	..	24	9,816	..
Tel'ok Ayer ..	34	114	..	..	..	14,055	5,270	..	..	..	172	..	..
Kandang Kerbau ..	409	18	..	..	80	6,687	7,624	..	..	..	1,505	108	..
Orchard Road ..	167	3	..	3	..	5,586	8,452	..	..	..	93	41	..
Maxwell Road ..	101	31	..	10	12	5,181	496	..	78	..	6,906	..	..
Joo Chiat Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Grange Road ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Peoples Park ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sims Avenue ..	2	10	..	..	..	35	..	..	..	..	15	..	..
	21,272	578	..	13	92	33,488	21,920	..	125	..	8,715	9,965	* 96,168
Town ..	..	..	..	..	..	..	50	1,629	10,681	523	..	3,280	16,163
Total ..	21,272	578	..	13	92	33,488	21,970	1,629	10,806	523	8,715	13,245	112,331

* = 57¼ tons.

M. N. MACMAHON,
 Cert. R. San. Inst.,
 Food and Market Inspector.

HEALTH DEPARTMENT.
Return of Prosecutions for the Year 1936.

OFFENCES.		TOTAL				
		Prosecutions	Withdrawn	Not Served	Convictions	Fines
Municipal Ordinance						\$ cts.
Obstructions	... ..	120	—	—	—	—
Offensive matter flowing into Public Drain	... ..	131	—	—	—	—
Establishing a private market	... ..	198	—	—	—	—
Unlicensed Offensive Trades	... ..	211	2	3	29	163 00
Using nightsoil/or urine as manure	... ..	213	—	—	—	—
Latrine etc. notice not complied with	... ..	219	—	—	—	—
Nightsoil kept for more than 48 hours	... ..	223	—	—	—	—
Filthy premises	... ..	233	1	2	27	105 00
Limewash notice not complied with	... ..	234	—	—	—	—
Non-compliance of notice for the destruction of rats and mice	... ..	235	—	—	—	—
Non-compliance of notice of demolition order of insanitary dwelling	... ..	236	6	2	121	381 00
Allowing premises to be overcrowded	... ..	237	—	1	4	22 00
Non-compliance with Nuisance Notice	... ..	246	5	9	6	25 00
Carried forward		218	14	17	187	696 00

HEALTH DEPARTMENT.

Return of Prosecutions for the Year 1936—(Contd.)

OFFENCES.	TOTAL				
	Prosecutions	Withdrawn	Not Served	Convictions	Fines
					\$ cts.
<i>Brought forward</i> ...	218	14	17	187	696 00
Non-compliance with Nuisance Order ...	3	—	—	3	5 00
“ “ Closing Order ...	—	—	—	—	—
Non-compliance of order for demolition of house unfit for human habitation ...	—	—	—	—	—
Non-compliance with Well Notice ...	—	—	—	—	—
Opening Well without permission ...	—	—	—	—	—
License not exhibited ...	—	—	—	—	—
Non-compliance with Mandatory Order ...	6	—	1	5	28 75
Byelaws Sections 58 & 211 M. O.					
Unlicensed Foodshops ...	265	15	37	213	621 00
“ Milk Vendors ...	68	3	—	65	274 50
Employing women without permission of H. O. ...	23	2	—	21	63 50
Opening licensed premises during prohibited hours ...	39	1	—	38	240 50
Conveying milk for sale without regulation bottles ...	14	—	5	9	32 50
<i>Carried forward</i> ...	636	35	60	541	1961 75

HEALTH DEPARTMENT.

Return of Prosecutions for the Year 1936—(Contd.)

OFFENCES.	TOTAL				
	Prosecutions	Withdrawn	Not Served	Convictions	Fines
					\$ cts.
	636	35	60	541	1961 75
<i>Brought forward</i> ...					
Failing to have name and address marked upon the vehicle/can ...	7	—	—	7	4 50
Unlicensed Piggeries ...	69	1	11	57	136 00
Filthy Stables, Cowsheds etc. ..	5	1	—	4	8 50
Breaches of the Foodshop Byelaws ..	63	—	1	67	163 00
(104-D)					
Markets and Slaughter Houses.					
Selling vegetables within 50 yards of market ...	—	—	—	—	—
Unsound Food ...	2	—	1	1	2 50
Slaughtering Animals except in Abattoirs ...	2	—	1	1	2 50
Market Byelaws ...	63	1	1	61	133 00
Sale of Food and Drugs Ordinance					
Selling Adulterated Milk ...	34	6	3	25	686 50
Selling Adulterated Whisky ...	—	—	—	—	—
	886	44	78	764	3098 25
<i>Carried forward</i> ...					

HEALTH DEPARTMENT.

Return of Prosecutions for the Year 1936—(Contd.)

OFFENCES.		TOTAL				
		Prosecutions	Withdrawn	Not Served	Convictions	Fines
	<i>Brought forward</i> ...	886	44	78	764	\$ 3098 25 cts. 25
Selling Adulterated Brandy ...	... Section 11-1	—	—	—	—	—
Selling Adulterated Green Peas ...	... „ 11-1	2	—	—	2	69 50
Selling Milk Deficient in Fat ...	... „ 11-1	—	—	—	—	—
Q. and P. Disease Ordinance						
Failing to report case of Inf. Disease ...	... Section 3	—	—	—	—	*20 00
Moving patient without permission ...	... „ 18	—	—	—	—	—
Exposing patient while suffering ...	... „ 18	—	—	—	—	—
Conveying patient in public vehicle ...	... „ 23	—	—	—	—	—
Failing to have child vaccinated ...	... „ 39	70	7	12	51	32 00
Failing to bring child for inspection ...	... „ 40	—	—	—	—	—
Registration Births and Deaths Ordinance						
Failing to Register Births ...	... Section 11	15	—	—	15	12 00
Failing to Register Deaths ...	... „ 11-1	—	—	—	—	—
	<i>Carried forward</i> ...	973	51	90	832	3231 75

* Final instalment of fine paid vide case No. 2597.

HEALTH DEPARTMENT.
Return of Prosecutions for the Year 1936—(Contd.)

OFFENCES.	TOTAL				
	Prosecutions	Withdrawn	Not Served	Convictions	Fines
<i>Brought forward</i> ...	973	51	90	832	\$ 3231 75
Destruction of Mosquitos Ordinance					
Failing to comply with notice ... Section 9-1	—	—	—	—	—
Recovery of costs of work done ... 8-1	—	—	—	—	—
Destroying Anti-malarial Works ... 15	—	—	—	—	—
	973	51	90	832	\$3,231 75

	Summary.	
Total Inspections	...	26,696
" Prosecutions	...	973
" Withdrawn	...	51
" Not Served	...	90
" Convictions	...	832
" Fines	...	\$3,231 75

N.B.—Costs are not included in the amount of fines,

H. BENJAFIELD,
Chief Sanitary Inspector.

RETURN OF NOTICES SERVED AND COMPLIED WITH ETC., DURING THE YEAR, 1936.

NATURE OF NOTICE.	Brought forward from last year.	Served during the year.	Total.	Complied with during the year.	Carried forward to next year.	REMARKS.
Limewash Notice	162	677	839	833	4	2 Cancelled
Intimation Notice	20	206	226	185	16	25 "
Nuisance Notice	46	340	386	319	67	
Anti-Mosquito Notice	256	844	1,100	580	517	3 "
Demolition Notice	18	143	161	129	32	
Well Notice	—	8	8	7	1	
Latrine Notice	—	2	2	2	—	
Abatement Order	—	5	5	5	—	
Mandatory Order	—	6	6	6	—	
Closing Order	—	2	2	2	—	
Total	502	2,233	2,735	2,063	637	30 Cancelled

H. BENJAFIELD,
Chief Sanitary Inspector.

Return of Licences Issued under the Offensive Trade By-Laws during the year 1936.

NATURE OF LICENCE.		Per Annum \$	Number Issued.	CASH RECEIVED		DETAILS OF LICENCES ISSUED																			
				\$	cts.	For One Year	For One Month	For 2 Months	For 3 Months	For 4 Months	For 5 Months	For 6 Months	For 7 Months	For 8 Months	For 9 Months	For 10 Months	For 11 Months								
Blachan Store	..	24	4	96	00	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Brick Kiln	..	50	1	50	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dye House	..	12	6	72	00	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Drying and Sorting Fish	..	12	7	44	00	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fruit Preserving	..	50	7	183	34	1	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Knacker's Yard	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lime Making	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lye Making	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Laundry	..	1	335	335	00	335	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Offal Boiling	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pottery Works	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Private Market	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rags and Bones Store	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sago Factory	..	50	4	200	00	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sauce Factory	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sheep or Goat Pen	..	12	5	35	00	2	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Sugar Boiling	..	50	3	150	00	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Soap Boiling	..	12	3	36	00	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sick Receiving House	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tannery	..	50	4	200	00	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cattlesteds, Ponystables, Cowsheds:																									
9 Animals & Under per head @	..	1	3	19	00	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10—14 Animals	..	10	4	40	00	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15—24 "	..	15	1	15	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25—50 "	..	25	2	37	50	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over 50 "	..	50	3	150	00	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fee for importation of Frozen Meat:																									
Australian Primary Producers Society	1	50	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
John Little & Co., Ltd.	1	50	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Singapore Cold Storage Co., Ltd.	1	1,000	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
The new Adelphi Hotel	1	50	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lim Khoon Heng	1	50	00	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTAL	397	\$2,862	84	380	..	3	..	2	1	8	..	1	2	..	..	..	..	..	..	..	..	..	..

H. BENJAFIELD,
Chief Sanitary Inspector.

